THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW
A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

OLD SERIES
VOL. 15, No. 4.

NEW YORK, APRIL, 1909.

NEW SERIES
VOL. 7, No. 4.

CAST LEAD WORK FOR THE HOUSE AND GARDEN.

By Walter Gilbert.*

The Editor of The Metal Industry of New York has courteously asked me to bring before your notice a renaissance which has of recent years taken place in England in the use of a material. I am referring to the use of lead and to the education of plumbers and molders in a material which to the artist of the Old World speaks of Haddon, of Durham and of Blockling, of Bolton Hall, of leaded turrets and of proud spires—of Melbourne or of Hampton Court, of Calais Belfry, the glories of Versailles and of many other works and places too innumerable to mention. Whatever may be said of modern English architecture of a public nature, I think the verdict of posterity will be that the English country house as designed by living British architects is worthy of being placed among the best periods in the development of architecture; certainly as the sanest, healthiest and most comfortable since architecture became the art of convenience in the Elizabethan period.

This modern domestic architecture has revived many of the arts which had fallen in the mud, and none I think stood more in need of this resuscitation than that of "plumbing"—the art of the lead-workers. It is hardly worth while to theorize as to why the lead work on our houses, until recently, has been so bad—the cheapness of the material may be a cause, in that the artist has thought it unworthy of his best efforts, forgetful of the triumphs of the past—it may be that the client has despised it, fearing that he had not sufficient value for money in the use of it. Sufficient for us that this bad time is rapidly passing and once more the artist can put his thoughts into a material the most ductile and easy to his hand and rescue it from the commonplace, and we now see work produced which is not only of practical utility but of beauty. I have just said this material is used for practical utility purposes, and I refer to the manufacture of rainwater head pipes, gutters and cisterns. Can any one doubt the value—the æsthetic value—of these necessary items to the house? There is an old axiom of "Don't spoil the ship for the sake of a pennyworth of tar," and another one, "It's the little things which tell," and I am sure many readers will remember houses which have been spoilt by blatant accessories, whether ceilings, or glass, or, externally, rainwater pipes.

In the illustrations I show of rainwater heads, downpipes and tanks, a little of the process of manufacture must be realized in order to appreciate the care and forethought in the design. It will be noticed in the illustrations that the modelling is in low relief, but in every case the modelling is such that it will leave the mold immediately, for there is no undercutting. This care on the part of the modeller is for practical purposes: (1) to keep the cost as low as possible, and (2) to keep the workmanship in execution as much as possible in the hands of the plumber. The manufacture and execution of rainwater requirements is essentially a plumber's business, and if this work were so elaborated as to necessitate molders to carry it through—it would be both bad business—for the price would become excessive—and bad art—because the proper purpose of entering into the common necessities of the building would be defeated by this result. Therefore the relief of the model must be flat and such as can be cast by the plumber on a sand bed, by simply pouring the molten metal out of a trough over an even surface or bed of sand.

FIG. 1. LEAD CISTERN FOR RAINWATER.

When the plumber has made his enriched sheet of lead he then starts to cut it up and fit together into the required shape by wiping the joints with solder by means of acetylene gas, as every plumber knows, and the lead head is complete as shown in the photographs (Figs. 1 and 2). I am not saying that the process is an easy one,

*Managing Director, Bromsgrove Guild, England.

for it requires skill, and I have not entered into details of the process for I understand that THE METAL INDUSTRY is a paper for men accomplished in the elements of their work and it is not my business to create amateurs.

The use of lead in modern building purposes as mentioned above is but one variety of the uses to which this metal has been adapted in England even in this direction. A most important development has taken place in recent years in England, no doubt owing also to the interest taken in domestic architecture. I am referring to the thought given to the garden—and once again a time seems to be coming when the artist will be as much sought after for his ideas and thoughts as in those days when it was the delight to people the woods with gods and goddesses, and Pan and Cupid chased one another among the flowers,

FIG. 2. RAINWATER HEAD AND GUTTER PIPE.

and Youth frolicked in the pools. Human thought has always been of value in the garden, and however much we may attempt to dispense with human handiwork we are compelled to have resource to it, for Nature is so vast and overwhelming in herself that humanity feels a certain loneliness if left without some such bond of sympathy which is part of and executed by itself.

For this reason once more it has become the mode in England to people the gardens and the pools with statues in lead and cement, and for an English garden no better material could be found than these—the cool gray lead is in perfect harmony with the foliage—the finish of the material should not be carried to such extent as in bronze —but should be strong, vigorous and broad—and yet at times delicate and gentle, accordingly as the subject desires.

Among the tenets of the Bromsgrove Guild—an amalgamation of artists in England which I have the pleasure to direct—is one which any visitor to the Chateau of Ver-

FIG. 3. LEAD GARDEN FIGURE.

sailles will see in Louis XIV's own handwriting, "Put childhood everywhere"—and in no place is the opportunity greater than in the garden. Accompanying these few words is a photograph of a figure recently executed for a rose garden and for the entrance to a park (Fig. 3).

These figures are cast in molding boxes as bronze figures are cast, but with a solid core; the metal is not pure, but an amalgam of lead, in order to avoid the sag of a soft material, and the work is but little chased. The charm and simplicity of both material and execution are for the very reason I have explained welcome adjuncts to the garden. And when one thinks of figures, the animals, both proud ancestral crestings as at Castle Hill in Devon, or monstrous as at Zion House, come back to memory, and then lead vases in all their shapes and sizes—simplicity itself as at Lord Fortesque's, or of great elaboration as in Lord Walter Kerr's famous Melbourne Gardens or the triumphs of Versailles, create pleasant thoughts. These are triumphs of the plumber's art—for they are cast in flat sheets of lead, and with great thought and care bent and worked to the shape and burnt together. It is little wonder then that men point with pride to these possessions, and once more it seems in England that the wealthy classes are using their discretion by purchasing modern works which give them pleasure now, and are, like their ancestors, storing prized possessions for their descendants. Fig. 4 is a lead figure of the Good Shepherd—for the Church of the Good Shepherd.

FIG. 4. LEAD FIGURE OF THE GOOD SHEPHERD.

NEW PROCESS FOR TINNING METALS.

The "Metall-Anstrich Syndikat" of Berlin has put on the market a new process by which tinning is effected by painting with a pasty mass and subsequent melting on of this latter. The tin is rubbed fine like ordinary bronze powder, and worked into a paint with a suitable menstruum. According to the requirements, a mass is made either of pure Banca tin and lead, or of tin, zinc and lead. Experiments with the new metallic coating show that bending, twisting and embossing cause no flaking. The tests for porosity show that the protective action of the coating on iron is the same as with the ordinary tinned sheet. The liquid used in combination with the pulverized tin-bronze or other alloy, has no etching action, and there is no unpleasant smell attending its melting. It is claimed no poisonous substance is formed in effecting the coating.

The author of the paper has made practical tests in tinning with this process, and certifies that all known metals, such as iron, copper, brass, etc., can be coated thereby. For articles the surfaces of which have not yet been atacked it is sufficient to rub them with emery or brush them with a metal scratch brush. The sand blast is also to be recommended. Any articles (especially already-used cooking utensils) must, before the final pickling, be cleaned with lye or a soda solution. The articles are brushed with the pickle, or dipped therein, until they are bright; are then well rinsed with pure water. The cleared surfaces should not remain long before being metal-coated. When the coating mixture has got somewhat stiff by too long standing it can be thinned with water. It must be well laid on, but not too thickly.

Large articles can be coated with the material and let dry. After the coating material has been applied, the article is to be heated with a soldering lamp, gas burner or alcohol lamp, or in a muffle furnace, until the material melts. After the melting the articles should be rinsed in water, and if necessary, brushed. Where a thick coating is desired, the process can be repeated. To get a polished surface, the metallic tin should be wiped smooth with a dry or tallowed bunch of waste or hemp. Wiping off is, however, not recommended for articles with uneven surfaces, which should be evenly tinned. Cast-iron articles cannot be tinned without previous treatment; they must be coppered. Those which have been cast in sand should, preferably, before coppering, be pickled in a solution of one part of fluoric acid in five of water.

After the castings have been coppered, they are to be painted with the material and again heated as before described. One kilogram of the powder (called "Epicassit") mixed with one of the menstruum, covers 20 square meters once; that is, one pound coats nearly 98 square feet. The process is suitable for tinning cast-iron or sheet-iron kettles after they are made up. Galvanized sheets suffer greatly in being worked in presses, because the coating is damaged and flakes off from the edges. Subsequent tinning by means of the new process will in many cases repair the damage.

ETCHING SOLUTIONS FOR BRASS AND COPPER.

By Emanuel Blassett, Jr.

Very little practical information can be found on the subject of etching in the text-books on electrometallurgy, and the writer has never seen a separate treatise on the subject. Of late much attention is given to the etching of name plates, clock dials, thermometer scales and art metal work of many varieties. As there are but a few firms that carry on etching on a commercial basis, the process is very little known and imperfectly understood. It will not be considered amiss, therefore, to describe one or two practical etching methods for the benefit of the readers of The Metal Industry.

The solutions given below are used by concerns who handle etched goods exclusively and will be found practical in every detail. The method of running the article to be etched as an anode in a sulphate of copper solution is not followed by firms who make a specialty of etching.

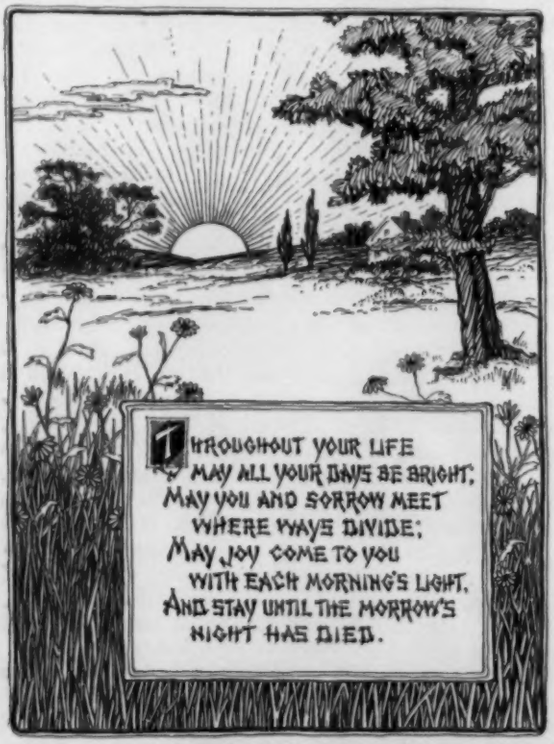

THROUGHOUT YOUR LIFE
MAY ALL YOUR DAYS BE BRIGHT,
MAY YOU AND SORROW MEET
WHERE WAYS DIVIDE;
MAY JOY COME TO YOU
WITH EACH MORNING'S LIGHT,
AND STAY UNTIL THE MORROW'S
NIGHT HAS DIED.

FIG. 1. AN ARTISTIC CREATION OF THE ETCHER.

The process is too slow and uncertain and I believe it is only practiced in an amateur way. The bath universally used for deep etching is simply a strong solution of chloride of iron (ferric chloride), used in proportions of about one pound of the ferric chloride to a gallon of water. It is essential that either the articles to be etched or the solution be kept constantly in motion, while the etching operation is going on. If this is not done, good etching is impossible. The usual method is to hang the articles to be etched on glass rods, which are placed across a movable frame, resting on top of the vat. The frame is moved backward and forward by means of power. By this means the solution is kept continually flowing over the plates, and smooth, deep etching is accomplished. The length of time the articles are to be left in the bath must be left to the judgment of the operator.

If the design is a light one (Fig. 1) the etching must not be continued too long, or the lettering and design will be partly or wholly destroyed. With a heavy design (Fig. 2) the operation may be allowed to go on from 1½ to 2 hours. The solution is used cold, and the electric current is not employed in this process. Such chemicals as nitric acid are seldom used in etching brass and copper, as the action is too violent. When the articles are taken from the solution they will generally be found to have a dirty yellow appearance. In this condition they are not suitable for coloring the background. The ordinary bright dip, composed of equal parts of nitric and sulphuric acids is seldom used for dipping the articles. It is not practical to use it on account of the traces of iron invariably retained on the background of the articles. This comes from the etching solution and it is a difficult matter to remove all traces of it in the bright dip. If it is not removed the background cannot be colored perfectly.

The right method of proceeding is to use what is technically known as the "brightener." It is made up in a vat of the same size as that containing the etching solution. The ingredients, added in the order in which they are given, are:

Water	25 gals.
Sulphuric acid	26 lbs.
Bichromate of potash previously dissolved in 25 gals. of water	40 lbs.

This solution will produce a smooth background and remove all traces of the iron. The solution, or rather, the work should be kept in motion in the same manner as the etching solution. After running the work for ten or fifteen minutes in this solution it will be found very bright and in a proper condition for coloring the background. The brightener itself will be found entirely suitable for light etching, such as done on small name plates and thermometer scales. The action, however, is considered too slow for deep etching, and the ferric chloride solution should be used when deep etching is required. Another etching solution extensively used is composed as follows:

One lb. ferric chloride dissolved in one gal. of water, to which are added:

Chlorate of potash	¼ lb.
Muriatic acid	1 qt.

This is especially suitable when small quantities of work are handled. It is used in a shallow wood tank, lined with rubberoid to insure lightness. The tank is given a rocking motion by means of power. The brass plates to be etched are laid flat on the bottom of the tank. The solution is then introduced which should flow continually over the plates. If the tank is at rest good etching cannot be accomplished. The tank need not be more than six inches in depth, and just enough of solution should be introduced to cover the plates. It is necessary to use the brightener in connection with this colution also.

The solutions used for coloring the background are the ordinary copper oxidized finish; the copper and ammonia dip (Fig. 3) and the black nickel solution. In using the copper oxidize, if the article is not made of copper, it is first given a 15-minute deposit in an acid copper solution. It is then oxidized in the regular sulphurette of potash dip. It is then immediately lacquered. Scratch-brushing the oxidize is not necessary. It is understood, of course, that the resist is washed off in benzine or turpentine or any other suitable solvent, before lacquering. The copper and ammonia dip is composed of:

Copper carbonate	6 lbs.
Liquid ammonia, 26°	2 gals.
Water	23 gals.

The copper is first dissolved in the liquid ammonia,

and after stirring, the water is added. This dip is used cold. This is the best black for yellow brass and is extensively used on etched goods. Compositions containing a large percentage of copper are difficult to color in this solution. The copper oxidize finish and the black nickel will be found more suitable for producing a black on low brass alloys.

The black nickel solution which I have used successfully as a background for etched goods is made up as follows:

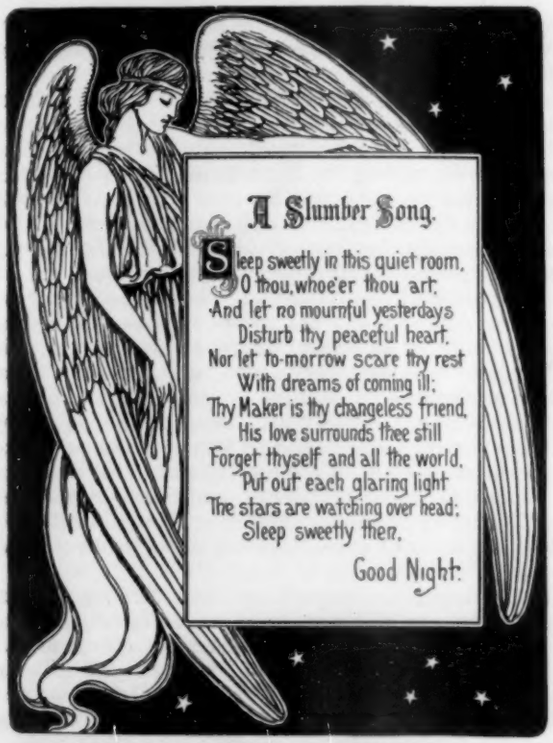

A Slumber Song.
Sleep sweetly in this quiet room,
O thou, whoe'er thou art;
And let no mournful yesterdays
Disturb thy peaceful heart.
Nor let to-morrow scare thy rest
With dreams of coming ill;
Thy Maker is thy changeless friend,
His love surrounds thee still
Forget thyself and all the world,
Put out each glaring light
The stars are watching over head;
Sleep sweetly then.
Good Night.

FIG. 2. AN ETCHED MEMORIAL TABLET.

Sulphate of nickel and ammonium.....	10 ozs.
Sulphocyanide of potash.....	2 ozs.
Water	1 gal.

Dissolve the sulphocyanide alone in a portion of the water and add gradually to the solution. Stir up thoroughly. The solution should now be made neutral by adding ½ oz. of carbonate of copper dissolved in a solution of carbonate of ammonia, to each gallon of solution. This solution gives a good, practical black finish for all classes of etched goods. It is not suitable for steel

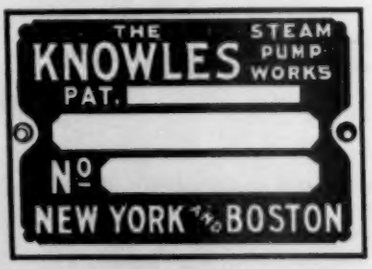


FIG. 3. NAME PLATE. COPPER AND AMMONIA DIP BACKGROUND.

or iron and the brass or copper to be colored must have a clean, bright surface before entering the solution. Not over 1½ volts should be used in depositing the black nickel, and the article should not be left in the solution longer than five minutes, or the color will be gray.

PLATERS' WRINKLES.

By C. H. Proctor.

(Continued from March number.)

SILVER PLATING BATHS.

In plating soft metal goods with silver, especially for cheap finishes, or where oxidized or gray effects are necessary, a ten minute deposit in the nickel bath helps to save silver. If the silver deposit cuts through, a whitish background due to the nickel deposit still results, where a copper or brass deposit would have to be "doctored up."

Trouble frequently occurs in flashing the nickel deposit in the silver striking bath, the result is a violet coating which readily peels. The following method to overcome the necessity of a silver strike for this class of work will be found excellent. After cleansing, flash in the warm cyanide of copper bath for three or four minutes, then the usual washing. A five or ten minute deposit in the nickel bath, the usual wash again and place in the cyanide of copper bath for a few minutes or until the nickel deposit is coated with copper, rewash and immerse in a dilute cyanide of mercury bath. A solution containing four ounces of cyanide and one-quarter to one-half ounces of yellow oxide of mercury will be satisfactory. Then wash and place in the regular silver bath. This appears to be a good many operations, but they are quickly accomplished when performed continuously and the results are sure and imperfect deposits are thus avoided.

In producing oxidized silver affects when a good dark color is desirable. After silver plating, copper for a few seconds in a regular cyanide of copper bath, then wash and immerse in a cold sulphuret solution, made up as follows: Two ounces sulphuret of potassium and one-half ounce of water of ammonia to each gallon of water. Scratch brush wet, adding a little sal soda to the brush water and then scour in any of the usual methods. This leaves the silver with a good white color beneath, instead of a grayish tone. For a French gray, scratch-brush the oxidized surface by applying a little pumice stone, moistened with water, to the brush. In this manner a gray tone is produced. Go over the high lights with a plater's hand brush and pumice stone to produce a contrast.

OXIDIZED FINISHES.

In producing dark bronze tones upon copper or copper plated articles, use in connection with the sulphuret of potassium a little sulphate of ammonia (this is a neutral salt) in the place of the water ammonia. A one-quarter ounce of the sulphuret and one-eighth ounce of the sulphate of ammonia dissolved in a gallon of cold water will be found an excellent solution for bronze tones. These bronze tones should be scratch-brushed dry with an old or very soft brush.

It is very often necessary to produce a black nickel deposit upon brass, copper or bronze goods for antique relief effect, also a good bright black with a polished surface. The simplest are sometimes the best. This finish can be produced in a few minutes. Dissolve fourteen ounces of powdered white arsenic in one-half gallon of boiling water to which is added eight ounces of powdered caustic soda. When cool add one-half gallon more water, to which is added one-half ounce of cyanide of potassium. Use anodes of wrought iron. On bright surfaces a bright deposit is produced. Use the same current strength as usually used for a nickel bath.

(To be continued.)

COPPER ROLLING MILL PRACTICE.

A SERIES OF ARTICLES ON THE SUBJECT.

By Copperman.

(Concluded.)

HEAVY COLD ROLLED COPPER FOR POLISHING.

But few heavy mills are in existence for this class of work, the rolling being usually done on the ordinary sized finishing mill. The process consists of rolling a pack of about 6 sheets of widths from 20 to 39 inches x .060 to .080 inch thick, *cold*, to gauges varying from 10 ounces to 20 ounces. Sheets 39 inches wide for 36 inch finished are seldom rolled thinner than 13½ or 14 ounces. To roll a pack of 39x100 inches 14 ounces and have sheets that are absolutely free from "chatter" or "pinch" marks, is a difficult task. It requires—first, good copper, dead soft, scaled, pickled and cleaned right; second, a stiff pair rolls with an even crown and proper speed; and third, a good roller and crew. Here again the speed question comes up, and I wish to state that experience proves that this class of work cannot be made on a high speed roll. The roller must be given some chance to control his pack, otherwise the sheets will be pinched and spoiled absolutely for polish work and usually for any use at all, and the rolls so marked that grinding may be necessary at once.

There was an installation of a 33x60 inch mill, ideal in proportion for such work, but run at a speed of 285 feet per minute, where every man who tried failed to produce good sheets. On the other hand, some of the best polished copper in the country is rolled on a mill still larger in size, but run at a speed of about 160 feet per minute. Screws for these mills should be of as fine pitch as can be built to stand the pressure, preferably ¼ inch.

COLD ROLLS.

The cold rolling of sheet copper is done almost entirely on a 20x60 inch roll, with perhaps one pair of 20x44 inch for finishing narrow sheets for polishing and tinning, and one pair longer than 60 inches for wide cold rolled.

The rolls are ground with an even crown, so as to touch the sheets for about ½ to ⅔ of their width on the first pass. The rolling of plain cold rolled is usually done three or four sheets at a time, all passes made on a slack screw until the finish, when screws are just down. Sheets are shifted after each pass so that during the process both sides of each sheet come in contact with the roll itself. Some rolls are equipped with a curved brass guide behind, which catches the front end of the sheets as they leave the roll, and turns them back over the top roll to the roller, who has by then traveled near enough to the roll on 96 inch sheets to be able to catch the end as it comes over. The roller and one helper, usually a boy whose duty it is to help shift sheets and straighten out corners and edges on the next pack, constitute the crew.

The screws on cold rolls are nearly always 1 inch pitch, although for finishing polishing sheets ¼ inch or even ½ inch would be better. To get good results, each pair of rolls should be driven from pinions, and not through another pair, as by the latter means the work on the first pair might be spoiled by the entering of a pack on the second pair, unless line up is just right clear through to the pinions driving the two pair. It is well in a plant of any size to have one pair of cold rolls longer than 60 inches, preferably 72 inches, although 68 inches is used to good advantage. This makes it possible to cold roll sheets up to 60 inches wide, although a very good cold rolled sheet can be made on the same roll on which it was hot rolled. Indeed, unless the wide pair for cold work is ground or turned to follow the hot roll, the sheet often has to be cold rolled on the hot roll anyway. In this case the latter must be polished up a little to take off scale and remove fine checks which usually appear in its surface.

It may be interesting to some readers to compare the cold rolling of sheet copper by the means described with the cold rolling of sheet steel. In these plants the cold rolls are smaller than the hot rolls, usually 22 or 24 inches x 32 to 42 inches, run by friction, and each housing made with two screws. Each screw has a short steel spanner, and when setting the rolls for rolling a certain gauge metal the screws are driven down tight with a sledge hammer, the adjustment for a perfectly flat sheet being made by driving the front or back screw, as the case may be, down the tighter. This puts the top roll in proper relation to the bottom, the driving down of both back screws throwing the top roll forward, which on a tight mill gives greater draft or pinch on the sheet.

Sheets are cold rolled one pass, two pass, or three pass, as may be required, and are always spoken of as so many pass cold rolled. In order to increase the rate of rolling, some plants have installed a separately driven cold mill with 3 pair of rolls in line, so that the sheets are passed from one pair to the other without any handling between passes. The rolls are turned to follow the hot mills, and it is really wonderful to see the class of work that comes out of a properly turned pair of cold rolls. A sheet may be picked up by the corner and it will hang as true in all planes as a sheet of glass, and this holds true even on 28 gauge.

One thought in regard to the location of cold rolls in a copper mill may be of advantage. Ordinarily the cold rolls are on or near the end of the main train, but always in the same building with the hot rolls, and often near the furnaces which always give out more or less dust that settles on the sheets and rolls. In some plants the tinning pots are in their vicinity as well. If the cold rolls were partitioned off away from all dirt, dust and gases, the results, especially on finishing for polishing sheets, would be much better, and also save much labor in wiping and cleaning. On polishing copper one cannot be too particular at any stage of its manufacture, and all who have had experience with it know this to be true. The isolating of these few pair of rolls would not cost much, and would pay in quality of polished copper alone. Keep shafting out of the room, as it always shakes dirt off the roof trusses, which drifts down on the rolls and sheets. In some plants, where the cold rolls are in the regular train, the rollers build a hood of boards or sheet over their rolls to protect them as much as possible from the trouble I have just mentioned.

STRIP ROLLS.

Every copper mill should be equipped with a few pair of 18 or 20 inch x 36 inch rolls for cold rolling strip copper. Some plants, having no such rolls in their copper mill, send such work to their brass mill to be rolled. Then it comes back for shearing, trimming and cold rolling, which means labor and loss of time in transfer. Some plants get out narrow polishing copper sheets in cold rolled packs the same as is done on 30x60 inches and larger, but the results cannot be compared with making it in strips or rolls. The cost is less per pound, the quality far better, and the per cent. of scrap about one-third by the latter way. (If you don't believe it, just take the trouble to keep a few records, and see.)

One pair rolls, at least, should have a coiler for hooping

up the metal ready for the fire, and each pair of rolls be pinion driven. No attempt should be made to finish 8 to 12 ounce copper, especially if light temper or dry rolled, on rolls not independently driven. The objections spoken of under "Cold Rolls" still hold good here, only the trouble is all the more liable to occur, and the results be still more disastrous than on cold rolled sheet. An installation, where *three* pairs of strip rolls are driven from one set of pinions which set next the drive, is being tried out, and may have to be shifted onto a longer bed plate and pinions put in to get better results.

Rolls, housings, pinions, etc., should be kept regular brass mill pattern, run at brass mill speeds, housings with ¼ inch pitch screws, and rolls as short as the widths desired will permit, in order to be able to reduce the metal as fast as possible. There are in existance some cold strip rolls recently put in, where a 20x42 inch roll is cut down to 19 inches in diameter for a distance of 8 inches from each end, leaving only 26 inches of actual roll face. This seems to be a waste of money in rolls and a loss of bed plate room, to say nothing of the spring with a 42 inch roll as compared to a 28 inch roll, which would roll the same widths as the above 42 inch, and do it in fewer passes.

One thing must be remembered when putting cold strip rolls in a regular copper mill train for hot and cold rolled sheet. We refer to the power required for driving such rolls. One pair of 20x36 inch running down rolls at 20 r. p. m. will take more power to drive them than several pair of hot finishing rolls, with breaking down and cold rolls thrown in, and this fact may be overlooked, as has been done only recently. A mill of size and speed given above, on 14 or 16 inch strip, will take 200 to 250 h. p. net to drive it, if the metal be given such reductions as the roll is good for. Of course such a mill finishing eight ounce copper, does not require much power, but for a plant where four pairs of rolls are put in for strip work, 20 in, say at 20 r. p. m., there should be allowed about 350 to 400 h. p. to drive them. With ample power and good stiff rolls strip copper can be rolled to 10-12-14 or 16 ounce for plain or tinned polished copper, in widths 10 to 20 inches, at a very low cost per pound, and with little scrap.

SCRAP.

The question of scrap, by the way, seems to have but little interest for the average copper mill man. Often no records are kept, and if he should be told he was making as high as 40 per cent. scrap on hot and cold rolled sheet combined, it probably would mean but little to him. If one-third the scrap made daily in a copper mill could only be sold at sheet prices, the money it would bring in above what it is worth as scrap might pay dividends even these hard times. Just figure out what it would represent to a concern shipping 750,000 lbs. of sheet copper per month to be able to market as sheet 150,000 lbs. of scrap each month, instead of melting it over into cake or casting it into brass.

CONCLUSION.

We have spoken of a few particularly new features of the hot mills of late installation, viz., a universal and a three high breaking mill. In the strip rolling line there is also a three high 20 inch mill being tried. The principle thing that may be said in its favor is that it should save some time in rolling, but not much, and I question if its reduced cost of operation will offset its extra first cost and cost of maintenance. On a two high mill for such work, the metal can be returned to the front side of the rolls after the first two or three passes on a truck, and after that the front end can be turned back over the spindles, which is common practice. On the three high the metal can all be passed through, and then returned back through the rolls, etc. Outside of this, I see no means of gaining time. One method of cold rolling strip from ¼ inch to No. 14 has never been tried by the copper or brass mills and that is the installation of a continuous mill. The idea is not new, except as applicable to copper instead of to another metal, and some copper and brass company, I predict, will have the nerve to try it in the next few years. For a little nerve, or a simple breaking away from old time-worn methods and conservatism is all that is necessary for its success. At a first cost of not over 8 and probably not over 6 times that of one plain two high mill of the same size (power not included), one roller and two helpers, or three helpers at the most, could turn out as much No. 14 copper hooped ready for the fire as a single pair of rolls could *do on its last pass only.* In other words, get the same output that would come from any one pair of rolls, run at its maximum efficiency if it were rolling but the last pass only, and save the labor of at least four rollers and their helpers, on the average. Allowing for four rollers at $2.50 per day, and ten helpers for the four rollers, at $1.50 per day, such a mill as described would save $25.00 per day, and pay for itself in four years.

In the above discussion the writer has tried to cover the subject of copper mills, as existing up to date, without going into any particular details of manufacture, which may be the basis of a subsequent article. Some readers may think that a few of the ideas suggested are fancies, and not practicable, but I wish to say that there is experience, keen observation and common sense behind all of them, and they will stand investigation.

I would like to hear from others through the columns of THE METAL INDUSTRY, and learn of the interesting features of other mills, and also their criticisms on what is written above.

CASTING OF ANCIENT BRONZE.

Bronze is an alloy of copper and tin and therefore distinct from brass, which is an alloy of copper and zinc. Many varieties of bronze are in use at the present day; and one remarkable feature of bronze is that the admixture with copper of the much softer metal, tin, in varying proportions, produces an alloy in most, if not all, cases, harder than the original copper. When the tin is in high percentage, as in the metal used in the speculae of telescopes, the resulting alloy is so much harder that, à priori, such a result of the mixture of two soft metals would have been thought impossible. The addition of tin, while increasing the hardness of copper, also renders it more fusible. In small proportions it but little affects the color of copper and it is difficult to recognize its presence by the physical characteristics of the copper except from that of increased hardness.. It is on this account that many articles of so-called tempered copper have deceived investigators. In nearly every case the hardness or temper is found on analysis to be due to tin combined with the small amount of impurities, such as iron, etc., which were nearly always present in the ores from which the copper was derived. The recognition of this fact may save some investigator from wasting his time and money looking for a "lost art," a search which may properly be classed with that for perpetual motion.

When it was once discovered that copper was fusible by heat it would naturally be but a short time before the more metallic appearing ores would be reduced to metal.—W. S. CORSE.

THE PASSING OF OLD METHODS IN A SILVER SHOP.

By J. G. Niederer.

About thirty years ago the workmen in the silver line in New York City were more or less interested in the report that Samuel Kirk & Son, of Baltimore, Md., were about to change from the old-time methods of working by hand to the newer system of using machinery for forming and in finishing their work. The report was hailed as good news, for business in New York was dull at this time, and as Samuel Kirk & Son did a large business it was believed that this change would make openings for a number of men to handle and operate the new machinery to be installed. With this idea for an incentive I made a trip to Baltimore to see Mr. Kirk. After a satisfactory interview in which we exchanged references, etc., he informed me that he was not quite ready to make the change but would surely call on me

Fig. 1

CYLINDER FOR VASE.

Fig. 2

VASE WITH BOTTOM SOLDERED ON.

when he was. A year from this time Mr. Kirk notified me that he was ready for me to take charge of the lathe room; I was preceded at the works by George McParland, of New York, who was in charge of the spoon department. Mr. McParland was one of the cleverest of spoonmakers and he was able to make anything in the tableware line with hammer, tongs and file, as well as to handle modern machinery.

Upon my arrival I found a good many old New Yorkers who had disappeared from the Gotham field years ago. Here were Harry Conway, the chaser, who afterwards became manager of the Baltimore Academy of Music; Clark, the chaser, known as the Yankee Skipper, who lived on a yacht built by himself. He would come to the shop for his work, carry it on board, where he would chase it, and then carry it back. Gillette, the chaser; La Salla, a well-known modeller and chaser; McCaffery, a well-known and most clever engraver, who was called "Scotchy" and who had left New York because it was "too eternally Gothamy" to use his words.

Among the old New York silversmiths were found George Kenny, Charles Kipp, and John Sehlstadt, who, by the way, simply stayed in Baltimore on account of historic associations, he having been made an example of in the well-known "blood tub" riots. Being a foreigner, the "Plug Uglies" captured him and imprisoned him in a cellar all night; in the morning of election day they dipped him in a tub of blood which they procured from a slaughter house, and chased him down the street to frighten the foreign element who might imagine they had a right to vote.

I found that the system of working they followed was far removed from what I had expected. The hollow vase was partly raised by hammer and a great part of it was "strapped" or soldered to form a cylinder first and then drawn into shape by hammering and a piece soldered on for the bottom—as shown in sketch Figs. 1 and 2. The handle would be soldered on to cover seam in body, and as a solder was used that held its white color well, the seam was not as noticeable as might be expected, particularly in view of the chasing which covered as a rule the whole body of the article.

As may be supposed, there were a great many punctures made in the walls of the various pieces by the chasers and in the earlier years a tin solder had been used, this easy running solder was used so that no fire coat would be caused in the firing. This practice, however, caused so much complaint that it was with great joy that the use of silver amalgam was welcomed. The use of this mercury plating was introduced by a silversmith named Jacoby, who afterwards became a member of the firm of Jacoby & Jenkins in Baltimore.

A very peculiar method was also in use in making forks, the stock for the tines would be hammered out to the size of the four tines, and then these would be separated by slitting up between each one with a chisel then bending back into proper position. See Figs. 3 and 4.

Fig. 3

STOCK FOR FORK.

Fig. 4

FORK WITH TINES CUT OUT.

The removal of the fire coat in the hollow ware was done by means of sharp steel scrapers before chasing.

There was no overseer or foreman in this establishment in those days. When a man needed new work he had to see Mr. Kirk, who was in complete charge, and frequently a workman would be kept waiting an hour or more before he was supplied. There was absolutely no "red tape" in the system and yet Mr. Kirk was singularly successful and prosperous. It is a fact, too, that some of the men worked honestly and conscientiously even though no one watched them. Now I believe the concern has all of the modern detail of systematic management, but I often wonder if they are as prosperous as when Henry Kirk "ran the shop all alone" twenty-five years ago.

In the product made in these earlier years by this concern there was a great deal of work of really meritorious character and a collection of some off these pieces would no doubt be of considerable interest in any exhibition. There would be an aggregation of hammered and chased work. In these pieces we find various subjects used for decoration brought out by repoussé work—Oriental, hunting, Indian and love scenes, stags and hounds in deadly struggle depicted in graphic manner and occasionally copies of the Italian Renaissance. Each scene designed and worked out in the repoussè by the chaser himself. Frequently there would be copies of the antique, but

rarely was there any plain polished work. I recall an order for plain Colonial ware that was made by another house, Mr. Kirk claiming that he did not care for this class of work, but the real truth was that the shop was not fitted up to make it.

The reader must not suppose, however, from what I have written that Henry Kirk, then proprietor, took this step gladly, for he had long fought against this innovation, which seemed to him to be almost a sacrilege, most stubbornly, for it had been and was his desire still to express in his work those merits which denote an expression from the chaser and silversmith. He had always allowed the greatest latitude possible for these artists to express their conceptions; and he now feared that the individuality as spoken by the hammerer's art would no longer exist in his product. True, his work at times had been scoffed at by Eastern manufacturers. Yet the demand for his goods had kept growing to extraordinary proportions and their peculiar merit of craftsmanship seemed to appeal to the public. The great cry that his prices were too high also grew apace and at last in despair he purchased the required machinery and started to work as did his "Yankee competitors."

When spinning of shapes, both round and oval, was begun, the men realized the quantity that now could be turned out as compared with the old methods, and there naturally was a feeling of uncertainty as to what the future might bring; but these misgivings were soon dispelled, for business increased and new hands were constantly added to the force.

THE RECOVERY OF PRECIOUS METALS FROM JEWELERS WASTE.

AN EXHAUSTIVE TREATISE ON THE SUBJECT, INCLUDING ALL FORMS OF WASTE.—TO BE CONTINUED FOR SEVERAL ISSUES.

BY JOSEPH CAUFFMAN.

(Continued from March number.)

ASSAYING.

The dish should not be filled with acid at the start, but the metal merely covered, and acid added from time to time as required, until all metal is dissolved. This prevents mishaps, and also saves acid, which is wasted if added too rapidly, as there is constant decomposition, and the more acid, the more of this sort of loss.

The material will not dissolve completely, on account of silver and solder in the metals; these become white, from formation of insoluble chloride of silver, and this remains on the bottom of the dish. When all metallic particles, however, have disappeared, the operation is done, and to make sure, all the white sediment should be crushed up with a glass rod; if all is soft, there is no metal left, but when there remains some, it is felt as a hard core inside the lumps of chloride; these should be beaten up and the last particles of metal dissolved with a little more acid. The dissolved metals form chlorides of gold and platinum, and when there is much of these, the liquid becomes dark and thick; this should be gently poured off into another similar dish and new acid added to the metal, always being careful to pour only clear liquid, not disturbing the metal and residue. When all the metal is dissolved, pour the dark liquid into the second dish, with the first pouring, then add a little water to the residue in the first dish, stir, let settle and pour off again; repeat this till the washings become colorless. The sediment of chloride of silver is laid aside and melted up later.

The dish of chlorides of gold and platinum is put again on the water bath and evaporated until dark brown and thick, nearly dry; then water is added, enough to make the liquid a rich, dark orange color; if too pale, too much water has been added, and if too dark, not enough; in the latter case some gold will stay with the platinum; in the former some platinum will stay with the gold. Then add a saturated solution of chloride of ammonia, which causes the formation of the double chloride of platinum and ammonia, which settles to the bottom, leaving the gold in solution. The "saturated" solution of the ammonia chloride (or sal ammoniac), is formed by dissolving in water as much of that chemical as the water will hold; this can be determined thus: There must be always a little remaining at the bottom of the vessel; as long as it dissolves, more must be added, until it will no longer dissolve. Continue adding this solution as long as the precipitate is formed—stir well and let it settle.

When the yellow "double chloride" has all sunk to the bottom of its dish, carefully pour off the liquid, which contains the gold, into a large, deep earthen jar or crock—preferably a white one, so that the progress of the operation can be fully seen. Over this jar place a smooth board, with a hole in the middle, large enough to hold firmly a large glass funnel. In the funnel fit a folded filter paper, and then gently pour into this paper the precipitated double-chloride of platinum and ammonia. When the liquid gold chloride is poured off or "decanted" from the platinum precipitate, care should be taken not to disturb the latter nor pour any of it out. Pour only the top portion, and as soon as the platinum begins to move and cloud the liquid, begin to pour it into the funnel, when the gold chloride will run through, leaving all the platinum on the paper. Pour slowly, taking care never to allow the liquid to come nearer than one inch from the top; then stop, and do not pour more in till the gold chloride has run through, making more room. The last part of the platinum is gotten out of the dish by washing it down into the funnel with a small stream of water from a "wash bottle." This is the usual way of getting the last portion of a precipitate into the funnel, and then, to wash all the liquid material out of the precipitate, water is poured in until the drippings are colorless.

This process is used here except that PURE WATER MUST NOT BE USED, as the platinum chloride dissolves in pure water and would run through the filter, back with the gold, and all the work would have to be done over again. Alcohol can be used, but, as this is expensive, the best thing is to use the solution of the sal ammoniac, which carries all the gold through and leaves all the platinum on the filter. This is allowed to remain in the filter, the whole being placed in a warm place, (a small drying oven for instance), and when completely dry, is put, paper and all, into a clean crucible and gradually heated till it becomes red hot. This burns off not only the paper, but all of the ammonia and also the chlorine, leaving pure platinum in the form of "platinum sponge," a porous black mass, which must be sent to the platinum works to be melted into ingots, for an ordinary fire cannot melt this metal.

RECOVERING THE GOLD.

The liquid poured off of the precipitated platinum chloride, and also the filtered part and the washings, contain the gold, which is dissolved in the form of chloride, and must be precipitated. For this purpose, make a saturated solution of ferrous sulphate, known as "copperas" (although it contains no copper), and add to the gold solution. This causes the gold to sep-

arate in a state of absolute purity, in the form of a chocolate-brown powder. This should be done in a white jar, so that the gold can be seen. The whole should be allowed to stand over night, in order to let all the gold come out of solution, which takes some time; next day pour off the solution into another jar. (Do not throw away, as a trace of gold always remains, which can be recovered by putting into the liquid a small sheet of clean copper; let stand a week, and a little gold will be found at the bottom). After pouring off the liquid from the main precipitation, empty, with a wash bottle, all the gold into a funnel lined with paper (as for platinum); wash with water till the filtrate (or washings) will not make a blue color when poured into a little ferrocyanide of potash solution; then let the paper and gold drain till dry, and place it carefully in a clean crucible—either sand or graphite. By the word "clean" we mean one that has never had anything but pure gold melted in it. Add a little saltpetre, which burns out any traces of impurities remaining in the gold; then a little borax, which takes up the oxides thus formed. The crucible is best heated before putting into the furnace, in case of dampness, which would cause cracking when suddenly exposed to great heat, and the gold would be spilled. Stand it in front of the furnace until too hot to hold in the hand, and then place in the coals, covering it with an earthen or graphite lid. Close the furnace, to keep the heat in; and when the gold is liquid, pour into a mold. If it is of good color, and soft, it is ready for use, and can either be re-melted and granulated, which offers a ready way of weighing out small quantities; or the ingot can be rolled into a thin strip or ribbon, and pieces cut off with shears.

If, however, on taking out of the mold, the gold should be at all brittle, it must be re-melted, with more saltpetre; some smelters add a little corrosive sublimate, but the vapors, unless quickly drawn up the chimney, are highly dangerous, being the worst of poisons. If the gold still remains brittle, it must be re-melted with three times its bulk of silver or copper, and parted.

PARTING.

We stated that the granulated alloy of gold and silver obtained from sweeps, filings and clippings free from platinum, is to be parted by dissolving out the silver (and copper), leaving the gold pure. If, however, the granules will not dissolve in nitric acid, more silver must be added, as in testing. Silver is not indispensable, as copper will do as well; but if the operator has some impure silver on hand, he can add it to the first metal and refine both of them at once.

Granulate again, and put the granules into a flat porcelain dish (never use metal dishes, as the acids will eat through). Cover the metal with weak nitric acid—half commercial acid and half water—and heat gently on a water bath. It is best to cover the dish (as in the case of the platinum), with a pane of glass, which keeps the liquid from bubbling or spurting out, and yet does not prevent the workman from seeing what is going on. The acid turns the granules black, which is the first showing of the gold; soon they fall apart, and gradually a soft blackish mass settles down. If the progress stops, pour off some of the liquid, and put new acid on. When no more action takes place, the gold is left nearly pure, but not quite. Then add a little full-strength nitric acid, and let boil for ten minutes or so. Pour off this acid with the first portion, and wash the gold with water, adding all washings to the other liquid. No filter is usually needed, as the gold is so heavy that it settles immediately.

To find if all the silver solution is washed out, test the washings by pouring a few drops into a clean test-tube or small glass, add a few drops of strong hydrochloric acid, if it produces a white deposit or precipitate, or even a milkiness, wash again, as this white material is silver chloride. When this test does not cloud the liquid, the gold is clean, and is then dried and handled exactly as in the case of the precipitated gold.

OBTAINING THE SILVER.

All the liquid poured off of the above, together with washings, etc., contains the silver, in the form of nitrate, and this is easily, cheaply and quickly precipitated by the use of a strong solution of ordinary salt. As this is added, a thick white curd is formed, consisting of chloride of silver, which is heavy and quickly settles to the bottom, and this is assisted by vigorous stirring. Do not add too much salt water, as a great quantity will re-dissolve some of the silver chloride, causing a loss. After the main part of the silver has apparently come down, add a few drops more of the salt solution, watching if any further whiteness is caused in the clear solution; as long as a cloud is produced, continue adding the salt.

Let the silver chloride settle for half an hour or so; if the liquid was too dilute in the first place, longer time may be required. When, however, all has settled, and the liquid above is perfectly clear (light blue, from the copper in it), pour it off, and filter the silver, washing as in the case of the gold. This silver chloride is clean when the washings no longer show any blue shade—they should be colorless. (The blue liquid can be saved, and the copper obtained out of it, by putting in it some clean sheet iron, and leaving for a few days, when the copper will be found on the bottom of the jar as a red-brown powder).

The silver chloride is dried and mixed with twice its bulk of soda bicarbonate, and placed in a clean sand crucible; do not use a graphite one, as the soda decomposes these rapidly, ruining the crucible and making a very dirty melt, which is difficult to handle. (The soda dissolves the clay that is mixed in with the graphite, and the latter comes off in a fine black flake, which forms a thick black paste with the soda, etc.) A large crucible must be used, the mixture, when put in not being allowed to fill it more than half, because, as it melts and decomposes, it swells and bubbles, and quickly runs over, if the crucible has been too full. It is a good thing to put a layer of half an inch of salt over the mixture, before putting it into the furnace, as this melts first and forms a cover that keeps the contents from rising. A cover can be used, but must not be put on tight, as the gases must be allowed to escape. The melt is finished when the contents are absolutely quiet and liquid clear; as long as bubbles of gas form the heating must be continued. When done, pour into an iron mold, and the silver will be found at the bottom, clean, pure and white. It can be left in the ingot form, or granulated.

Another way to obtain the silver from this white chloride, is to take the latter, after it has been washed clean, and put it into a jar (preferably a white one, so that the operation can be fully seen), and cover it well with water, and then add clean sheet iron or zinc. The chloride will be seen to turn black wherever the sheet metal touches it; this is due to the iron (or zinc) taking the chlorine, forming iron or zinc chloride and liberating the silver as pure metal; this is the black powder. Stir frequently, and add more sheet metal, as long as there seems to be any white powder left.

(To be continued.)

THE TURRET LATHE AND ITS EQUIPMENT.

CUTTING TOOLS.

BY EASY WAY.

(Continued from December, 1908, issue.)

There should be an ample amount of starting cutters made to fit standard shanks (these cutters can be made of a round steel flattened on the end for the smaller work) for centering, facing and chamfering the rough stock to avoid as much as possible the more expensive tools coming in contact with the scale of the casting. For the larger work, starting and boring cutters should be made of flat steel and used with holders provided for that purpose.

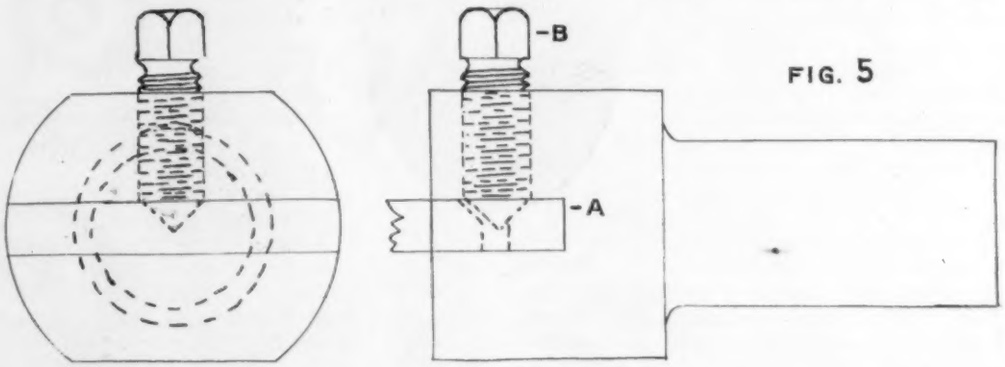


FIG. 5

The sketches show three different styles that have proved satisfactory. Fig. 5 is for short cutters, the slot in the holder is milled central and at right angles to the shank of the holder. The hole that the set screw, B, fits in is drilled by a jig at a fixed distance from the back of the slot A. A jig is also provided for drilling the steel which has been previously squared on that end so that the relative position of the set screw and holes are as shown, thus forcing the end of the cutter firmly against the end of the slot.

After the cutter has been drilled, it is put in a chuck that is a duplicate of the holders and turned to the desired shape and size. A quantity of flat pieces of stock cut in suitable lengths squared on the end and drilled should be kept in stock ready to be put in the chuck and turned to any desired shape at short notice. Cutters of standard shape, finished and hardened, should be kept in the tool room in sufficient quantities to admit of no delay for the regular work. Fig No. 6 is for longer cutters, it has an extra slot extending towards the back of the holder and an extra screw for clamping the cutter, besides forcing it back to the end of the slot with the set screw. Fig. No. 7 is a more expensive holder but can be used to good advantage on certain classes of work.

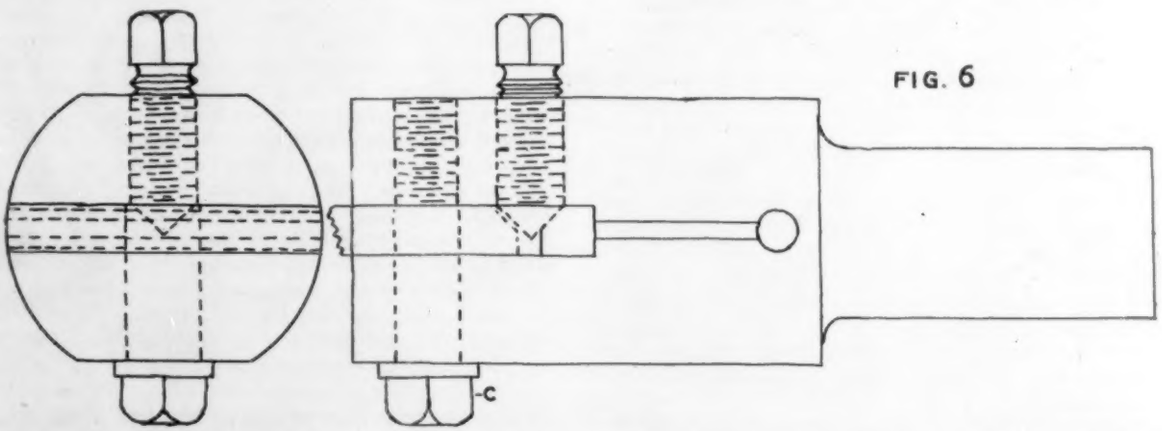


FIG. 6

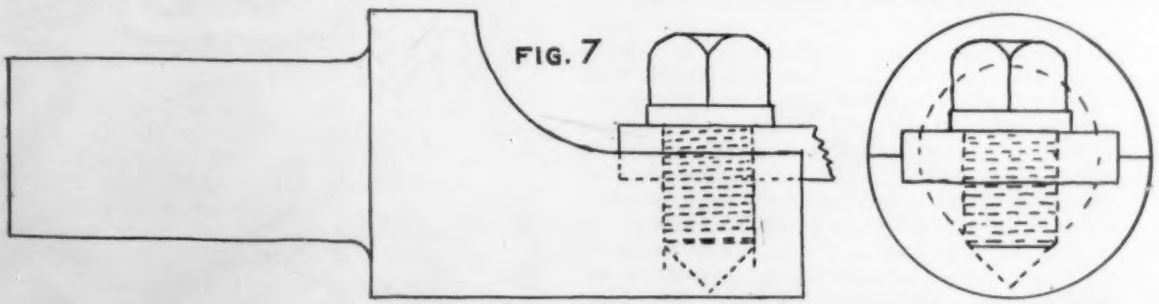


FIG. 7

(To be continued.)

A HISTORICAL SKETCH OF THE ZINC INDUSTRY IN EUROPE AND AMERICA.

By D. J. Lemal.*

Zinc has long been known as a metal in China and India, and was used by the Greeks and Romans in some of their coinage, but it is comparatively lately that it was extracted from its ore by Henkel. He first extracted zinc from calamine in 1721. The honor of its discovery is due to the Germans, but the manipulations to extract it in a commercial way is due to the Belgians. A company known as the "Vieille-Montagne," soon after its discovery started in the suburbs of Liege, but as it was and still is laborious and hot work, they had to give great inducements to their workmen in the line of drinks and amusements between heats, as I will call it here. This means the morning charge of the furnace, drawing the metal in the afternoon, and the evening charge, which is a partial charge of the furnace. The amusements were principally in bowling alleys in the yard of the plant. Bonuses were given to new men willing to work at the furnaces, as well as to the one that brought them to the works.

D. J. LEMAL.

OPERATIVES.

At that time three men worked the furnace. They were called the "brigadier," the "grand manoeuvre," and the "petit manoeuvre." It will be seen here that honor was bestowed on them through the names. In English practice that honor is lacking, as they are called the "charger," the "long shift" and the "short shift." These names are appropriate, as the long shift (grand manoeuvre) stays at the furnace as long as the charger (brigadier) does, which is twenty-four hours, which time is required to reduce the heavy morning charge in the furnace, and after which these two men rest for twenty-four hours. The short shift (petit manoeuvre) helps at the charging only and goes home between charges; he is considered the laborer, as he is under the orders of the brigadier and the grand manoeuvre. These two gentlemen are quite proud of their position, although they are dressed only in overalls and short blouse, which they have to change several times a day as these clothes get soaking wet from perspiration.

At the present time there are more men at the furnaces, as these are so much larger; the inducements in the shape of bowling alleys and drinks have been taken away, and no more bonuses are given, as the men brought up to this work could not be driven from it now. The Vieille-Montagne Co. still takes good care of its workmen and can teach a lesson to other countries in the treatment of its employees, as it may be said that the workman is taken care of from the time of his birth until his death, as most sons follow the vocation of the father. When a child is born to one of these workmen, the doctor is notified to attend, as this doctor is expected to take care of the family. The inspector of the company calls and sees for himself if anything is needed, such as coal, coverings or groceries, etc., for the company has stores for such emergencies. In case of death of a member of the family the coffin is supplied.

When the workman is too old to work he is pensioned off; or if he is without children he is placed in a home built by this company for its employees. In case the workman dies and leaves a widow she receives a pension, and besides can work for the company, wheeling a wheelbarrow of coal, unloading coal boats for the company, or taking away ashes from the furnaces; a man's work here, but in Belgium women are as strong as men. Although it is hard work they are happy, going to work early in the morning dressed in their short skirts with blouse, red stockings and stove-blacked sabots (wooden shoes), and woe to the man who attempts to make any fun of them.

DEVELOPMENT OF THE INDUSTRY.

Germany followed Belgium in producing spelter, or commercial zinc, with more or less percentage of other metals mixed in it, such as iron, lead, silver, arsenic, etc. Spain followed in 1800, and then France and Italy. Now we come to America, where at Friedensville, a village near Bethlehem, Pa., farmers were building their stone fences with rich zinc ore. Belgian zinc workers were sent for. Nineteen came and started to smelt zinc from the ore of Friedensville, at South Bethlehem, Pa., in 1859. Soon after a second batch of Belgians came over. All of these men are now dead except one, to my knowledge.

The mines at Friedensville also supplied for a number of years the Bergenport Zinc Works, situated at that time in Bayonne, N. J., but now abandoned to make room for the Standard Oil Works. Another zinc plant which has gone out of existence lately was the Passaic Zinc Works, located at Jersey City, N. J. This company worked ore called Franklynite, an ore containing a great percentage of iron. It is mined at Franklyn, N. J. This ore is also used by the New Jersey Zinc Works at Newark, N. J. These two are the only zinc works in this part of the country. There are a number in the West, notably in Wisconsin, Missouri, Illinois and Kansas. There is also one in Virginia. The reader will see that the zinc smelting works in America can easily be counted, and accounts for the lack of knowledge about zinc by a great many people.

*A son of one of the first zinc smelters in this country.

CASTING LOST WAX WORK IN FRENCH SAND MOLDS.

By W. Nelly.

In using French sand, which I would advise to be free from clay to a certain extent, the sand used for facing I mean, when you make lost wax process castings, you want to be sure and not get the coating more than from ¼ to ½ inch in thickness. Get it as thin as you can and wind some very thin iron wire around your impression after the coating is well under way.

For the sand which is intended to fill the space between the impression and the flask or box I would use a mixture of French sand and Albany sand, the object being of mixing the French with some other kind of sand which is coarser and hence more porous. Do not ram this sand too hard. If you follow these directions and your metal don't "lay against the mold," then you can trace the cause of your trouble to the making of your core.

If you make a French sand core don't ram it too hard—have it vented in as thorough manner as you possibly can. Don't spare tapers, of which the market to-

day offers us the greatest variety. Use a fine grade of black to paint the surface of your core with. Another way of making your core would be to use a mixture of brick—not fire brick—dust and plaster, about half and half; mix it to a creamy consistency and pour it in your hollow wax model.

Carefulness and cleanliness are the greatest factors to a good result. An even thickness, proportionate to the size of casting, is the main factor to obtain a non-porous casting—too great an amount of metal around a small core will in every instance cause trouble, no matter how low the pouring heat of the metal.

Bake your molds long enough. A good practice for those who have had no great amount of experience in the line of casting in this process would be to have a round hole in your mold ½ inch in diameter, reaching as deep toward the center as possible; communicate this "core" in a straight line to the outside of the oven, so you can look in this hole, and when you see a dark red glow all the way through the hole then, and only then, your mold is thoroughly baked. Every trace of wax as well as every other gas-producing substance has been burnt out.

Let your mold cool. It should be entirely cold for alloys not containing zinc or aluminum—and just warm, a little more than blood heat, for alloys containing zinc and aluminum. This is for all hollow castings. You should have red-hot molds for very thin castings not hollow, flowers for instance.

Experience only will teach you the relation between the heat of your mold when you pour it and the pouring heat of your metal, these two items being regulated only by the character of the piece you are going to cast, and, in consequence, the way you gated your piece and the way you have built your mold.

If you follow these directions and stop and study your past experiences in casting statuary work, and draw conclusions, then you will know how to handle your next piece and the success will be far better than you could have ever expected.

There is a whole lot to say about the wax, too. Pure white beeswax should be used for wax models. This wax, being too hard in itself to be worked, can be softened with turpentine enough to suit; also a little rosin should be used. Remember you don't need scales, only lots of judgment. For more common work yellow beeswax, being cheaper, can be substituted for the white.

For gates and filling-in cerecine can be used in place of beeswax, this costing about one-half the price of beeswax. To this rosin can be freely added to about ⅓ of the total amount of wax you require.

Everybody likes to give the wax models some kind of a color. These can be mixed with the wax. English vermillion, chrome yellow (light or dark), ultramarine and ivory black are four colors which can be used without fear of any trace being left in the molds after the wax is burnt out. With these colors used singly or in connection any shade from white to yellow, red, blue, green, orange, black can be obtained.

THE FOUNDRYMEN'S CONVENTION.

A Special Report of the Arrangements by Our Cincinnati Correspondent.

Cincinnati, Ohio, April 1, 1909.—The local committees on arrangements for the annual meeting in Cincinnati during the week of May 17-22 of the American Foundrymen's Association, the Foundry and Manufacturers' Supply Association, The Foundry Foremen's Association and the American Brass Founders' Association, all with allied interests, have completed their plans for the conventions, and Secretary Finch, of the Cincinnati Industrial Bureau, stated to-day that from five to eight thousand people will be attracted to the Queen City of the West by the assemblage of men of the metal industries. The Industrial Bureau has appointed committees to look after the matter of entertaining the delegates, their wives and friends, and Secretary Finch bases his estimate of the attendance on the reports he has just received from the secretaries of the various associations named in the foregoing. He says that the convention promises to be one of the largest held in Cincinnati in the past decade, and the men of the metal industries are writing him letters to the effect that the convention promises to them to be the most interesting and instructive of any held within the same period of time. Cincinnati happens to enjoy a central geographical position and her fortunate situation on the map makes the town easy of access to the metal men.

The headquarters of the four conventions will be the Sinton Hotel, a magnificent structure located at the southeast corner of Fourth and Vine streets, and the headquarters of the exhibits and displays of machinery and supplies will be in Music Hall, on Elm street north of Twelfth, and within easy walking distance of the hotel section of Cincinnati. The south wing contains 50,000 square feet of space, but not enough to accommodate all of the displays, so the local committee will have to build a temporary structure on the banks of the Miami and Erie canal, that forms the western boundary of Music Hall, and within a stone's throw of the south wing. The temporary structure for exposition purposes will have a floor area of about 5,000 square feet. So far one hundred supply and machinery houses have engaged space in both structures.

The local committee on entertainment has advanced its work to such an extent as to be able to announce to-day the two main features of the free entertainment to be provided for the delegates and all others who come to the convention with credentials that indicate that they are in any way interested in the metal trade industries. On Tuesday evening, May 18, a smoker will be conducted in the Sinton Hotel, and the whole of the palatial hostelry will be at the disposal of the metal trades men. On Thursday, May 20, the delegates, their wives, their sweethearts and their friends will be conducted to Coney Island by river steamboats and there they will be permitted to feast on burgoo and other things to their hearts' content. The burgoo is going to be made especially for the occasion by Francois Joubert, of Lexington, Ky., who has achieved for himself a national reputation as a burgoo maker. It is said that he has seasonings and condiments for the burgoo with the virtues of which only a few select cooks are acquainted, and he has placed an order in Italy for some of the flavorings that will go into the burgoo. Meanwhile, too, he has placed an order for a number of Texas cattle that are to be slaughtered for the dish and from Arizona will come the sheep whose meat adds daintiness to the taste of the burgoo. Joubert has orders to make burgoo for eight thousand guests, and if each guest gets away with a tin measure full of the burgoo it can readily be calculated that four thousand pints will be the amount of the burgoo to be served. But allowance will be made

for a larger capacity than a tin cup measure. The concomitant of the burgoo will be the Kentucky mint julep a la Watterson. Henry Watterson, the famous Louisville editor, is the man who has defined the recipe for the real Kentucky julep, and the juleps will be brewed according to his formula. In addition to that there will be other things to eat and drink, such as some of the beer that has helped to make Cincinnati famous, besides cold ham, slaw and what not. The chairman of the committee that is arranging for the Coney Island feast is J. K. Pollock, of Rodgers, Brown & Company.

Coney Island is a summer pleasure resort on the Ohio River about fourteen miles east of Cincinnati and occupies a more beautiful location than the Coney Island in New York. It is reached by river steamboat and by electric cars, but at the time in May in which the convention is to be held the weather in Cincinnati will be sufficiently warm to inspire all the convention folk with the desire to make the trip by boat rather than by rail.

The sessions of the various conventions are to be held in the two assembly halls of the Sinton Hotel and in the Odeon. The assembly halls of the hotel are located on the ninth or top floor and are exceedingly well adapted for the purpose. And so is the Odeon, which is really an annex to the Music Hall in Elm street. The assignment of halls has not yet been made.

Reception committees are to be appointed a few days before the convention to meet the delegates and other guests at the railway stations and escort them to their respective headquarters.

The men who are devoting their time and talents to the work of arranging a comfortable sojourn for the metal trades men are assigned to committees as follows:

Finance—Geo. McG. Morris, Theo. Bollman, Law Walter, Fred. J. Brunner and Walter Geier.

Entertainment—J. K. Pollock, James A. Green, Harry Frohman, Frank M. Eaton and John Sargeant.

Halls—John Hill, John J. Bruce, Justus Thorner, F. W. Weissman and H. Black.—C. F.

List to Date of Convention's Exhibitors.

Arcade Manufacturing Company, Freeport Ill.
Brown Specialty Machinery Company, Chicago, Ill.
Barnett, Oscar, Foundry Company, Newark, N. J.
Bartley, Jonathan, Crucible Company, Trenton, N. J.
Berkshire Manufacturing Company, Cleveland, Ohio.
Birkenstein, S., & Sons, Chicago, Ill.
Buch's, A., Sons Company, Elizabethtown, Pa.
Burroughs' Adding Machine Company.
Calumet Engineering Works.
Canadian Machinery.
Carborundum Company, The, Niagara Falls, N. Y.
Castings.
Cleveland Wire Spring Company.
Crivel, Geo. F., Company, Buffalo, N. Y.
Curtis & Co. Mfg. Company, St. Louis, Mo.
Detroit Foundry Supply Company, Detroit, Mich.
Detroit Testing Laboratory, Detroit, Mich.
Diamond Clamp & Flask Company, Richmond, Ind.
Dixon, Joseph, Crucible Company, Jersey City, N. J.
Falls Rivet & Machine Co., Cuyahoga Falls, Ohio.
Foundry, The.
Foundry Specialty Company, Cincinnati, Ohio.
Garden City Sand Company, Chicago, Ill.
Goldschmidt Thermit Company, New York.
Goyne, R. F., Brass Melting Furnace.
Hauck Manufacturing Company, Brooklyn, N. Y.
Hawley Down Draft Furnace Company.
Hickman-Williams & Co., Chicago, Ill.
Hill & Griffith Company, Cincinnati, Ohio.
Herman Pneumatic Machine Company, Zelienople, Pa.
Killing's Molding Machine Works, E. Davenport, Ia.
Kroeschell Bros. Company, Chicago, Ill.
Macleod, Walter, Company, Cincinnati, Ohio.
McCormick, J. S. & Co., Pittsburg, Pa.
Monarch Engineering & Mfg. Company, Baltimore, Md.
Mumford, E. H., Company, Philadelphia, Pa.
Obermayer, S., Company, Cincinnati, Ohio.
Oliver Machinery Company, Grand Rapids, Mich.
Osborn Manufacturing Company, Cleveland, Ohio.
Paxson, J. W., Company, Philadelphia, Pa.
Pickauds, Brown & Company.
Pridmore, H. E., Chicago, Ill.
Robeson Process Company, Au Sable Forks, N. Y.
Rockwell Furnace Company, N. Y.
Sellers, Wm., and Company.
Sly, W. W., Manufacturing Company, Cleveland, Ohio.
Smith, J. D., Foundry Supply Company, Cleveland, Ohio.
Squire, Ed. E., Molding Sand.
Standard Sand and Machine Company.
Sterling Wheelbarrow Company, Milwaukee, Wis.
Tabor Manufacturing Company, Philadelphia, Pa.
Whiting Foundry Equipment Company, Harvey, Ill.

NEW SMELTING CONCERN.

Copper and Brass Industries Allied With New Company.

The daily press reports that a new smelting concern has been formed on a large scale, and has with it as incorporators men of wide industrial and financial reputation. The corporation has been formed as a rival of the American Smelting and Refining Company and has a capital stock of $50,000,000 of which at present only $10,000,000 will be issued. John D. Ryan is the president of the new company, and Dennis Sheedy, of Denver, a former director and member of the executive committee of the American Smelting and Refining Company, is vice-president. J. W. Allen has been elected secretary and treasurer.

The directors and some of their affiliations are Urban H. Broughton, president of the United Metals Selling Company; Charles F. Brooker, of the American Brass Company; Thomas F. Cole, of the Butte Coalition and Greene-Cananea Company; John D. Ryan, of the same interests; Adolph Lewisohn, of the United Metals Selling Company and the General Development Company; E. C. Converse of the United States Steel Corporation; Thomas Morrison, of Pittsburg; C. A. Congdon, of Duluth, Minn.; Charles H. Sabin, president of the National Copper Bank; Dennis Sheedy, of Denver, Colo.; William D. Thornton, Charles F. King and J. W. Allen.

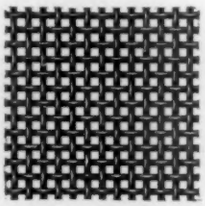
Besides being affiliated with the Amalgamated and the Lewisohn interests, as indicated by the Directorate, the company, through Charles F. Brooker, becomes identified with the largest manufacturers of brass and copper in the country, the American Brass Company and other manufacturing concerns in Connecticut, in which Charles F. Brooker is active, and the largest single buyers of copper in the market. The new corporation has taken over the Raritan Refining Company of Perth Amboy, N. J., which was owned by the United Metals Selling Company. This plant, which with additions made last year is the largest refinery in the country, has a capacity of 20,000,000 pounds of copper a month. Payment for the works, it is understood, was made in cash and in stock of the smelters company.

The new concern is also building a new smelter in Utah, which will shortly be connected by a seven-mile siding with the San Pedro, Los Angeles and Salt Lake road, operated as part of the Harriman system. This smelter, which is to be completed by January 1, 1910, will have a capacity to start with of 2,000 tons a day. It will be operated as a direct competitor of the Garfield plant of the American Smelting and Refining Company.

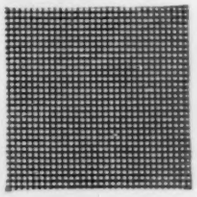
(See Correspondence Page, Waterbury Letter, for further particulars.)

"WIRE CLOTH, AND ITS MANY USES."

"Wire Cloth" up to a short time ago has received very little attention from contractors, builders and manufacturers, in fact, very few know the many uses to which it can be put until some time or other they are compelled to use this article, after which they can readily see the necessity of wire cloth in a thousand different ways. Not only do the contractors, builders and manufacturers use this particular fabric, but the farmer, the miller and the baker use it in their trade. The farmer uses several different meshes of the fanning mill grade to screen grain and seeds of various kinds. Valuable information having been furnished the farmers recently by the New York Agricultural Experiment Station regarding the proper mesh and screen to use for alfalfa seed, of which they recommend 20 x 20 mesh as the standard for this particular seed. The miller uses the tinned milling grade of wire cloth to screen the flour during its process of manufacture. Then comes the baker, who uses a certain kind on



12-MESH, 19-WIRE BRASS WIRE CLOTH—MINING GRADE.



30-MESH, TINNED BRASS WIRE, MILLING GRADE.

which to make the pretzels, kümmel wecks, etc., which we eat daily.

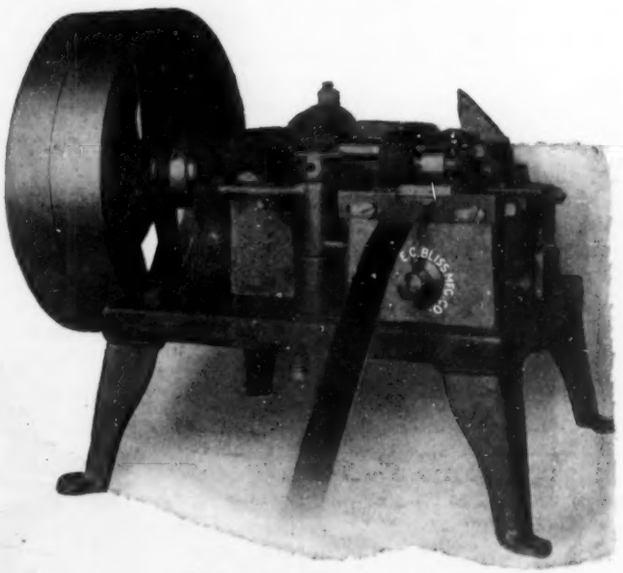
In nearly every foundry you will find wire cloth of a certain grade, which is used to screen the various kinds of sand used by the foundry men. In our large tobacco factories and fruit-drying establishments we find wire cloth used in the form of a drying belt on which the tobacco is laid and allowed to dry with much better results than any other means. Fruit is dried in the same manner, the only difference being in the mesh, of which there are several kinds for this purpose. The grade of wire cloth used for tobacco or fruit-drying is made from a steel wire coated with a heavy film of zinc, after it is woven, thereby soldering each intersection, and making the cloth strong and durable. This also prevents rusting, and naturally prolongs the life of the fabric. It also prevents the discoloration of the fruit or tobacco, and for this reason is more sanitary There is also another grade of wire cloth made, termed mining cloth, which is used in gold, silver, copper and iron mines, as well as coal mines and in many cases used in gypsum, phosphate and chemical works where a heavy and substantial screen is needed. This grade of wire cloth is made of either steel, brass, copper or phosphor bronze wire, as may be required for screening different kinds of ore. In cases where acids have to be contended with, phosphor bronze wire cloth is best adapted, as it is not affected by acids as is brass, copper or steel. Even the milk we drink is run through a fine light grade of brass wire cloth, the meshes ranging from 40 to 60.

In fact, there would not be room enough in these columns to mention all of the "uses of wire cloth," however, should the reader desire any further information regarding wire cloth in any form, same can be secured by writing The Buffalo Wire Works Co., Buffalo, N. Y., who are extensive manufacturers of all kinds of wire cloth, wire window guards, stall guards, wire signs, wire lockers, wire enclosures for tool or wine rooms, elevator cabs and enclosures, and in fact anything in the wire or metal line. Their No. 5 catalogue gives an excellent idea of the class of goods they manufacture, as well as some useful information for those using or contemplating to use wire cloth. The cuts show some of the applications of wire cloth.

THE BLISS SOLDER CUTTER.

Primarily, the automatic flat stock solder cutter here illustrated was made for their own use by the E. C. Bliss Manufacturing Company, of Providence, R. I.; it has, therefore, been tried out very thoroughly in their own factory and is now placed on the market. The machine is intended to cut all sizes and kinds of solder used by manufacturing jewelers, and to cut it automatically. This is very easily done with a micrometer adjustment so that a size can be duplicated to less than a thousandth part of an inch. The machine is a rotary one; that is, the cutter bar revolves on a horizontal shaft running in phosphor bronze bearings made especially large so as to eliminate wear as far as possible.

The action of the cutting tool is rotary, like a mill on a milling machine, although a mill of one tooth or cutting



AUTOMATIC FLAT STOCK SOLDER CUTTER.

point. It can be kept sharp very easily and will stay sharp longer than in the reciprocating type of solder cutter. The feed is adjustable and can be changed while the machine is in operation by simply moving the micrometer screw for any desired length of feed required, and by the use of this fine adjustment any size can be duplicated with extreme accuracy. The power is supplied to a side shaft and transmitted to the cutting shaft by gears having a ratio of 2 to 1.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

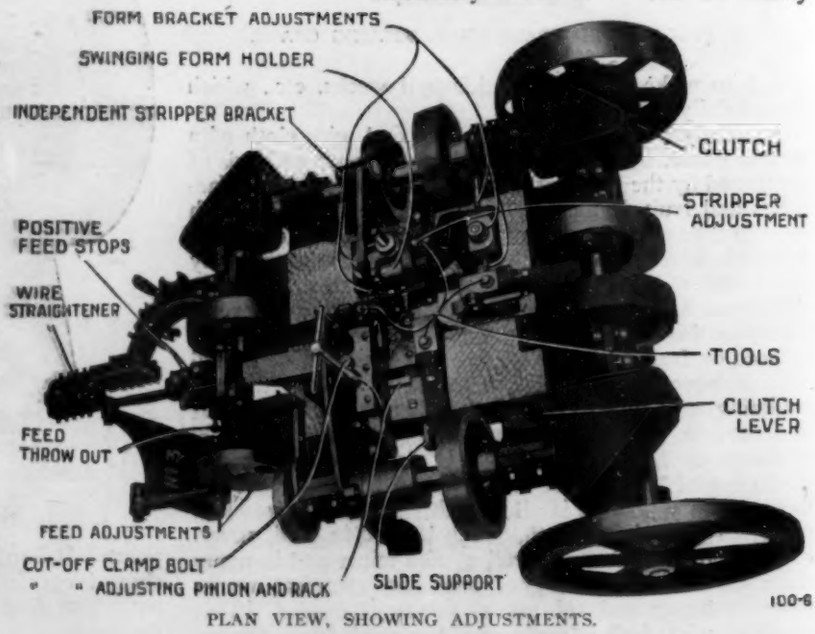
A NEW WIRE FORMING MACHINE.

The machine shown in cut 100-5, commonly known as the Automatic Four Slide Wire Forming Machine, and largely used by wire goods manufacturers, has been entirely redesigned, several new and novel features introduced, and is now being manufactured

AUTOMATIC FOUR SLIDE WIRE FORMING MACHINE.

and put on the market by The Baird Machine Co., Oakville, Conn. Having had many years' practical experience in the operation of wire working machinery, the Baird people in designing this machine, kept in mind many little kinks that make for increased efficiency, with the result that necessary adjustments have been made as few, as simple and as get-at-able as possible, and other points in design as, easy cams, larger shafts, etc., have been very thoroughly attended to. Among the features deserving of special mention are: The wire straightener, all the rolls of which face the front so that the wire is in plain sight of the operator as it is being straightened. The feed is greatly simplified, an improved crank mechanism being used, and, as it does away with the cumbersome and noisy gearing and slotted lever arrangement with their awkward adjustment, and also the friction which all know eats up power, causes much wear, and resulting in inaccuracies in length of wire fed, will surely be appreciated by the operator. The adjustments necessary for the Baird Feed are to simply loosen the crank pin nut, turn the adjusting thumb screw, and retighten the nut. For accurate feeding, positive stops are provided on the feed slide, being held by a clamp, and which are very simple and easy to set.

The feed grip is operated independently, and does not require any adjustment, nor does the binder cam, the time of gripping and releasing the wire being practically the same for any length. The ease and quickness with which the new Baird cut-off can be adjusted is certainly away ahead of the old method, which was to loosen one or more screws, and then pound the bracket back and forth until right, resulting in marring if not damaging the machine. The new way provides for loosening one clamp bolt and with the same wrench operate a stud pinion engaging with a rack, the heads of both being close together on top. The swinging former is also a great improvement, as either a stationary or moving form can be used in the same bracket, which is a heavy, solid casting. The form holder is suspended from a pivot held forward to the wire line by a spring and carried back by the front tool until backed by the solid bracket, this form of motion being more speedy and easier on the machine than when having to move a heavy slide. This form holder can be held back by a set screw to obtain a stationary form or it can be easily



PLAN VIEW, SHOWING ADJUSTMENTS.

taken out, and a solid form put in, being clamped in place by the cap.

A friction clutch pulley is also provided with this machine, doing away with any necessity for a countershaft, and enabling the operator to slowly try and at

the same time closely watch the operation. The friction can also be set so that any undue strain will stop the machine and so prevent the breaking of tools. All adjustments are on top of the machine and can be reached by the operator from a position in front of the machine, as the plan view or cut, No. 100-6, will show. The machines are made in six sizes, No. 0 to 5 working wire up to 3/8" diameter and 15" long.

These and other things are more fully illustrated and described in Baird Bulletin No. 100, a copy of which can be obtained on application to the manufacturers.

THE AMPERE-HOUR METER FOR DIRECT CURRENT.

A new device which will prove of great value to the electroplating business is the ampere-hour meter just being put upon the market by the Sangamo Electric Company of Springfield, Ill. This meter is built on the mercury motor principle that has made the direct current wattmeters manufactured by this company so well

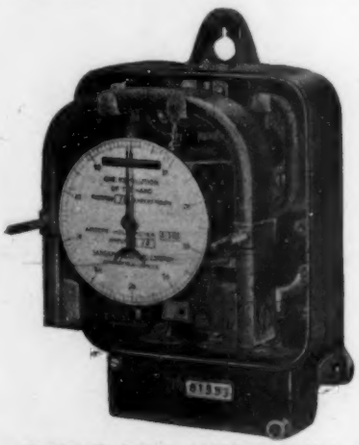


FIG. 1. SERVICE TYPE AMPERE HOUR METER, CASE REMOVED.

known. The construction and operation of this meter is as follows:

The meter consists essentially of a copper disc armature immersed in mercury, contained in a mercury cup or chamber, so constructed as to absolutely prevent spilling or escape of mercury in any position in which the meter may be placed, contacts being imbedded in the walls of the mercury chamber, so that current can be led in and out through the mercury and the armature. When a current passes across a magnetic field, there will be a stress exerted upon the conductor carrying the current, tending to displace it. That is, we have, as shown in Fig. 1, a pair of poles to which the large energizing per-

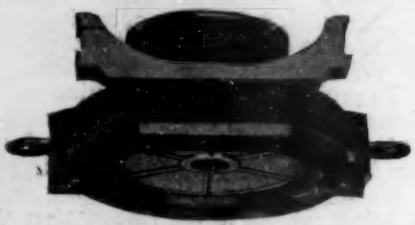


FIG. 2. MOTOR ELEMENT, ASSEMBLED.

manent magnet is bolted, the tips of these poles approaching closely to the lower side of the armature chamber, so that the armature inside, immersed in mercury, is subjected to a powerful field on each side of the center.

When current passes through the armature and across the two fields, there is a rotative effect or torque exerted upon the armature, and the amount of this torque, and consequently the rate of rotation, will vary in the ampere-hour meter solely according to the amount of current passing through the armature, as the field, energized by the permanent magnet, remains constant. The armature box containing the armature and mercury, and having the imbedded contacts at each side, is shown in Fig. 2. The cover or cap on the mercury chamber is arranged somewhat like an invertible ink-well, the shaft of the armature passing through a sapphire ring jewel, located in such a way that spilling of mercury is prevented, even if the meter is turned completely upside down.

From the description of the mode of operation, and from the view of the meter in Fig. 1, it is evident that the construction of the meter is the simplest possible, there being no coils, moving wires or anything of the sort. As the meter is designed to rotate at the same rate either forward or backward, no compensating windings have to be, or are employed, and there is no light load adjusting device, as the meter is without any potential energizing field. There is, therefore, only one adjustment, this being the adjusting device for the speed, as described below. The absence of all coils and unnecessary parts renders it extremely unlikely that the meter should get out of order, no matter under what conditions of service it may be used.

The application of the ampere-hour meter to electroplating processes depends upon the employment of the automatic cutoff attachment. The plater desires to deposit a certain weight, say, of silver, upon the work to be plated. He knows by consulting his previous records or a chart (a description of a good one was published in THE METAL INDUSTRY for November, 1907) just how long it will take to deposit the amount of silver desired with a given current. He therefore "sets the meter" by putting an insulated contact point at zero on the dial, and by taking an auxiliary circuit out through a pair of extra binding-posts in the meter, a contact can be effected when the recording hand comes around and touches the insulated pin at zero, operating thereby, through a relay battery circuit, and thus opening a switch in the charging circuit, cutting off the current in the tank or by ringing a bell to notify him that the weight of metal has been deposited. These meters are now being delivered by the selling agents, Machado & Roller, of 203 Broadway, New York City.

LONG LIFE OF A CRUCIBLE.

A crucible holding 400 pounds of metal ran for 75 heats, giving a production of 30,000 pounds in castings. The furnace that it was used in is the "M. R. V." now being introduced in this country by R. F. Goyne, Hotel Frederick, New York City. The run was made at the factory of The Nathan Manufacturing Company, 416 East 106th street, New York City. Mr. W. L. Abate, general manager, calls our attention to an error in the account of this furnace published in the March number of THE METAL INDUSTRY. The types made us say that the average loss in melting was one-half of one per cent. This should be one and one-half per cent. He also states in this connection that the saving in fuel over oil amounts to 10 cents for 100 pounds of metal melted.

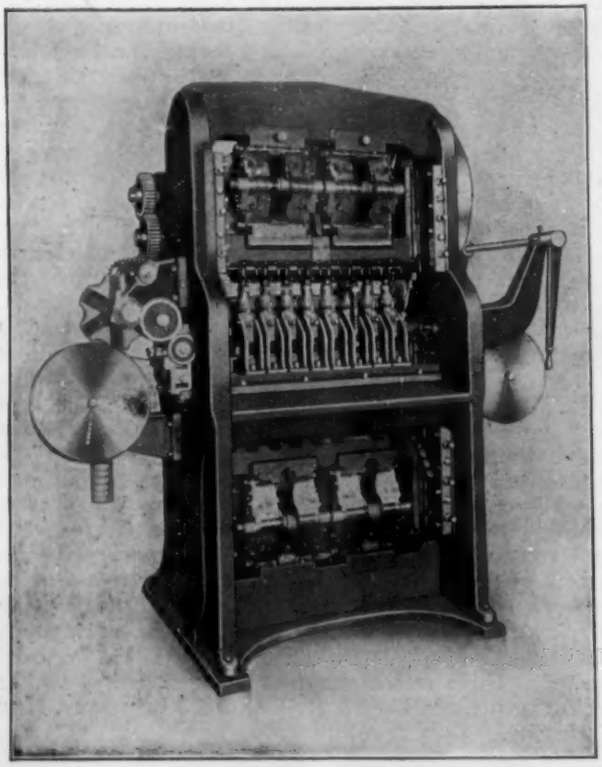
ALUMINUM SOLDER.

The Electrical Maintenance and Repair Company, Newark, N. J., is marketing the Noflux Aluminum Solder, an invention of Dr. Reinhold, a German chemist now residing in this country. The Leading Brass Company, St. Louis, Mo., has been appointed Western distributing agent.

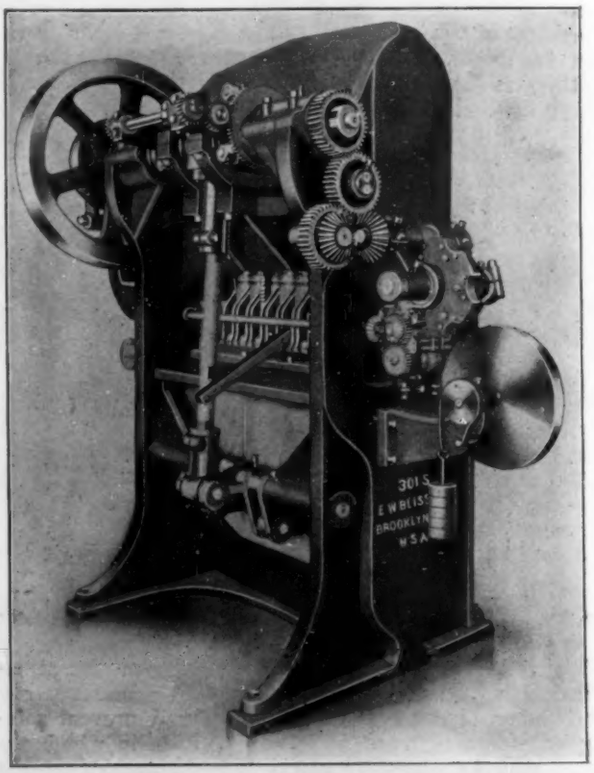
"BLISS" AUTOMATIC DOUBLE SLIDE PRESS.

In the accompanying illustration are shown two views of an automatic double slide press recently designed and built by the E. W. Bliss Co., No. 22 Adams street, Brooklyn, N. Y. The press was designed to produce rapidly and accurately from ribbon stock small sheet steel and sheet brass articles, the manufacture of which requires a series of operations. The machine produces 180 finished blanks per minute, requiring a total of 1,460 operations per minute. The press performs eight operations at each stroke of the slide (after the first seven strokes) a finished blank being produced at each stroke. The elimination of all intermediate handlings, the saving in labor and shop room, and the entire absence of any danger to the hands of the operator are special features of this press. The top and bottom slides are operated by toggles driven by one shaft, the operation of this shaft being controlled by a friction clutch, by which means the press at any point of the stroke is always under the instant control of the operator. Another additional advantage of this type clutch is the fact that the press can be stopped or started while the feed is on its point of dwell, which is not the case where the conventional positive press clutch is used, due to the fact that presses so equipped stop on the top center while the feed is at its highest speed and must necessarily stop and start with a certain amount of shock which has a tendency to strain the feed mechanism. In cases where ribbon stock is being fed this also causes some slip of the ribbon with a consequent irregularity in the feeding.

The top and bottom toggle connections are each independently adjustable, enabling the changing of the timing of the operations. In this way the press may be adjusted so that either the top or bottom slide may finish its stroke first and then dwell until the other slide continuing performs the operation, the movement of the slides in relation to each other depending on the nature of the operation to be performed. The feed is actuated by a 6-point Geneva stop motion, which feeds 120 degrees and provides an ideal motion for a feed of this class. There is provided for the stock a reel with friction hold-back, and for the scrap a reel with geared drive arranged with a compensating device, insuring uniform tension on the stock, regardless of the amount of scrap on the reel. The dies are each in a separate and independent sub-press and can readily be removed and replaced any number of times without the slightest danger of shearing the most delicate dies.



FRONT VIEW OF "BLISS" AUTOMATIC DOUBLE SLIDE PRESS.



REAR AND SIDE VIEW, SHOWING FEED AND STOCK REEL.

The stock used being ribbons or strips of suitable width is used as a feeding medium and in this way a very high rate of speed is attained. The stock passing from left to right the entire width of the press is controlled by a set of rolls on each side of the press. In case of work requiring drawing operations, the drawing is done previous to the blank being taken out of the ribbon, thus allowing the metal to contract in every direction. To provide for this contraction and the consequent change in centers, the dies are arranged in the independent sub-presses which permit of adjusting the distance between the centers of dies, to match the distorted spacings due to the drawing operations. The blank being cut out of the ribbon after the drawing operations, is again forced back into the scrap by which it is carried along to subsequent operations. With this ribbon feed very accurate work can be produced, and owing to the fact that the work is always under absolute and instant control, the press can be operated at from three to four times the speed possible when the blank is loose and advanced step by step by a finger or carry feed.

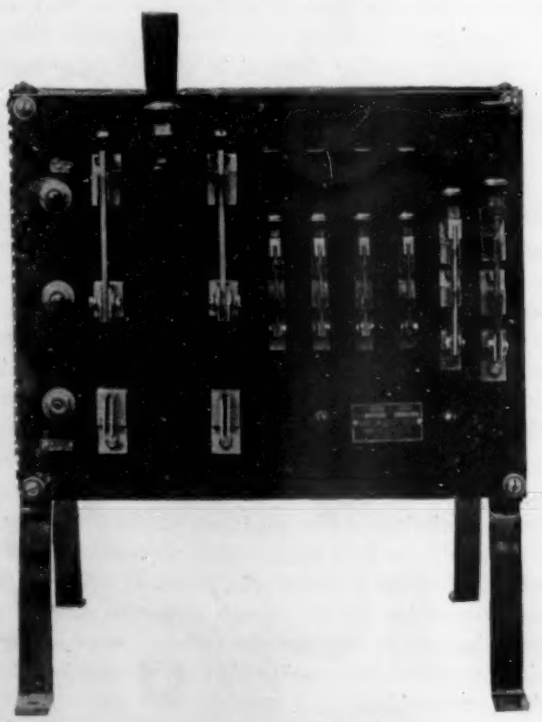
NEW POLISHING GRIT AND BURNISHING COMPOUND.

An innovation in the methods of preparing small brass and steel work for plating operations has been evolved by Haas Brothers Company, of Newark, N. J. By the use of their polishing grit and Hascoline burnishing compound, it is possible to entirely eliminate the present methods of wheel buffing. By the Haas process, the work in the shape of buckles, buttons, pins, etc., of brass or steel are simply introduced into a tumbling barrel, with a paste made of polishing grit, sawdust and water, and tumbled for 30 hours. This operation "cuts down" and smooths the surface. The articles are next freed from particles of grit by simply running cold water into the barrel. The next operation is dipping in a bright acid dip for brass, but for steel this is unnecessary. The work is then ready for the usual plating treatment. The work is then put into a tumbling barrel with steel balls and covered with a mixture of the Hascoline burnishing compound and water, in the proportion of 6 ounces of compound per gallon of water. This second tumbling is complete when the desired finish is attained, usually in 5 or 6 hours.

These two materials were produced by Haas Brothers only after long and expensive investigation and consequently can be thoroughly relied upon to do all they claim for them, if their instructions are followed out. Full instructions and samples of these materials will be gladly furnished by the makers, Messrs. Haas Brothers Company, 602 Union Building, Newark, New Jersey.

NEW PLATING RHEOSTATS.

The Ward Leonard Electric Co. of Bronxville, N. Y., have designed a complete line of plating rheostats for line control. The accompanying cut shows the line rheostat. This is a unique and new design for this

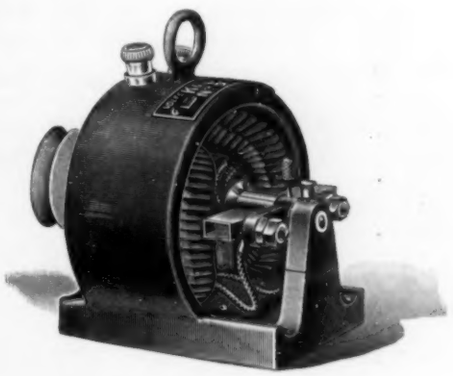


A NEW PLATING RHEOSTAT.

apparatus. It offers great possibilities. It is designed for single voltage and double voltage control. The cut shows a double voltage type to be used on a 5- and 10-volt circuit, i. e., either on one leg of a 3-wire circuit having 5 volts on each leg, or upon the total 10 volts. There is a main line switch (fused when so desired), which closed in one direction gives any ampere from 1 to 40 on 10 volts, and when closed in the opposite direction gives 80 amperes on 5 volts. This gives 31 steps of control on either voltage. Each switch with its resistance is designed to be connected across the full 5 or 10 volts, respectively. The various numbers of steps are obtained by using the switches singly or in parallel. As the resistances are designed for the maximum voltage that can be applied upon them, "burnouts" are impossible. These rheostats are designed for any capacities and voltages.

NEW PLATING DYNAMO.

Kendrick & Davis, of Lebanon, New Hampshire, manufacturers of dynamos, motors and other electrical



KENDRICK & DAVIS PLATING DYNAMOS.

goods, have recently improved their plating dynamo, shown in the accompanying cut, by the use of a high-grade mica-insulated commutator. Fig. 1 shows the usual method of small commutator construction, in which the segments are attached to the insulating core by threaded pins or rivets; the open spaces between the segments being relied on for insulation. Fig 2 shows the new K. & D. mica-insulated commutator, which has been subject to severe test for the past year or more. The segments are extra heavy of hard cop-

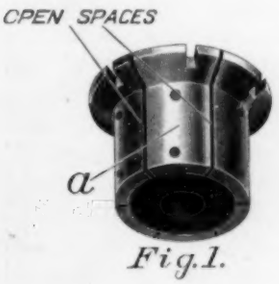


Fig.1.

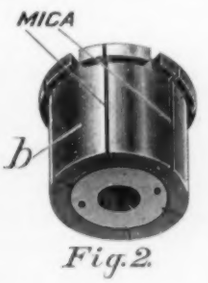
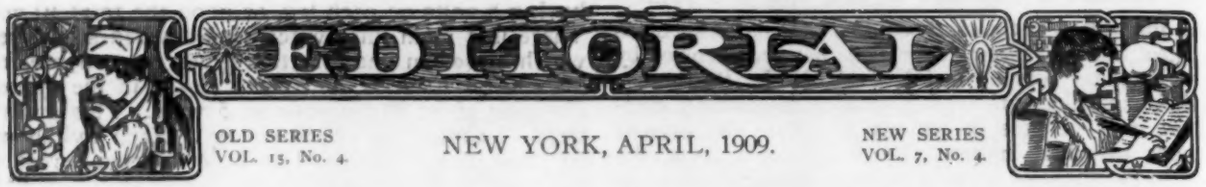


Fig.2.

per. Accurately punched mica segments are used for insulation. The component parts of the commutator being rigidly clamped together, the mica is held between the copper segments as in a vise. The firm claim that these commutators will remain efficiently serviceable until practically worn out. This plating dynamo has the K. & D. resilient tension self-adjusting brushes on adjustable yoke. Bronze bearings, with dust-proof oilers. Wound for different outputs up to 15 amperes. Smoothly finished in black enamel.



OLD SERIES
VOL. 15, No. 4.

NEW YORK, APRIL, 1909.

NEW SERIES
VOL. 7, No. 4.

THE METAL INDUSTRY

THE CONSOLIDATION OF

THE ALUMINUM WORLD
THE BRASS FOUNDER AND FINISHER
ELECTRO-PLATERS' REVIEW
COPPER AND BRASS

Published Monthly by

The Metal Industry Publishing Company
(Incorporated)

61 BEEKMAN STREET, NEW YORK CITY

Telephone No. 4983 Beekman Cable Address, Metalustry

PALMER H. LANGDON, ... *Editor and Publisher*

Subscription Price, $1.00 per year, postpaid to any part of the World.
Single copies, 10 cents

ADVERTISING RATES ON APPLICATION

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ENTERED FEBRUARY 10, 1903, AT NEW YORK, N. Y., AS SECOND CLASS MATTER UNDER ACT OF CONGRESS MARCH 3, 1879.

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COPPER ROLLING MILL PRACTICE.

In this number of THE METAL INDUSTRY we print the conclusion of the article by "Copperman" on modern rolling mill practice, which began in the January number. This detailed description of rolling mill practice we commend to our readers as worthy of careful preservation. It is the only authentic and reliable review of this practice that we know of being in print today. It describes clearly and forcibly all of the different types of mills and processes, ancient and modern. A great many minor points are touched upon, and without actually disclosing anybody's pet schemes a number of "kinks" are given, which should prove valuable to those engaged in the business.

The plan view published in the January and February installments, if put together, will give a basis for actual workings of an installation of this kind. The number, sizes and working speeds of the various mills recommended are thoroughly reliable and are gleaned from the long and well-earned practical experience of our correspondent. The comparisons drawn between steel and copper practice are interesting and his suggestions that more attention be paid regarding new devices, with a view of increasing tonnage at less cost, are well worth investigating.

To anyone reading the article and studying between the lines, as it were, it becomes apparent that "Copperman" holds the opinion that it is largely traditional influence that has kept the copper and brass rolling mills in a rut until within the last few years. That he is correct is evident by some of the new and labor-saving devices now being employed by both old and new mills alike. As the years go by it seems as though copper and brass practice approaches closer and closer the methods followed in iron and steel. THE METAL INDUSTRY would be pleased to hear from its readers in relation to this article, either criticising it in part or whole or making suggestions for further extension.

NATIONAL ELECTROPLATERS' ASSOCIATION.

The Association of Electroplaters of the United States and Canada is now a fact. After several years of determined effort on the part of Charles H. Proctor, who years ago was far-sighted enough to see the need of such an organization, he now has the satisfaction of seeing his ambition gratified and reaping his reward by being elected as the first president.

The new association starts out on its career with a charter membership of sixty members and promises and expressions of endorsement from all over the country. The original idea was to confine the membership to foremen platers only, but such widespread interest has been

displayed that the scope has been broadened to include not only the class mentioned above but also any one who is interested in the electro-deposition of metals as well as any one whose services may be considered of value to the association.

A study of the constitution and by-laws as just adopted, published in our ASSOCIATION and SOCIETY columns will give a clear idea of the object and aim of the association.

In this connection it may be well to quote from a letter received from Dr. Richard Moldenke, secretary of the American Foundrymen's Association. He says:

"When I saw the call from Mr. Proctor in your valued journal calling for expressions of opinion on the advisability of forming such an association, I promptly offered the services of the American Foundrymen's Association in aid of the movement. This not only in furtherance of the original resolution at Philadelphia, but because many iron founders have nickel-plating departments connected with their establishments. I see, however, that the movement has developed into a gathering together of foremen platers only, which, while serving local purposes, is to be regretted as less valuable than would be a national body in which owner and foreman would combine their efforts for advancement along technical lines.

I have been watching the trend of local foundrymen's and foremen's associations, and can only feel that much of this work is wasted effort. At the foundrymen's meetings more than half of those present are foremen sent by their employers, whereas the foremen's meetings are seldom well attended, and hard to keep alive. A combination of the two, on the other hand, seems to go very well, and the laborious efforts in regard to securing papers are cut in half. While, therefore, I do not expect to take the initiative in forming an American Metal Platers' Association at the Cincinnati Convention, if there should be a desire manifested in that direction, I will be very happy, on behalf of the American Foundrymen's Association, to be of every assistance that I can."

Now that the constitution has been designed to include just such a class as mentioned by Dr. Moldenke it seems as though there would be no need for another society. It might be suggested, however, that manufacturers and dealers in platers' supplies, etc., join not only the Electroplaters' Association but also the Foundry and Manufacturers' Supply Association in order that they might exhibit their products at the same time in annual convention.

TENSILE STRENGTH OF TOBIN BRONZE.

In the March issue of THE METAL INDUSTRY the statement was made that Tobin Bronze has a tensile strength of upwards of 79,000 pounds per square inch and an elastic limit of 54,000 pounds. These figures were intended to be general and to express the highest limit obtained and not necessarily a guaranteed strength. A correspondent remarks that the figures are too high; and perhaps they are for every day use. The *Journal* of the Franklin Institute of June and September, 1891, gives the figures 79,600 pounds and 54,257 pounds respectively. THE METAL INDUSTRY for June, 1903, gives a test of a sample .078x.582 inches as 66,000 pounds and when rolled to .04x.619 as 95,000 pounds tensile strength. In the same article it states that the strength of the Tobin Bronze in the yacht *Reliance* runs to 80,000 pounds tensile strength per square inch. In relation to the power required to operate the extrusion machine the pressure given should be from 600 to 1,200 tons on the ram and not per square inch.

ADVERTISING FOR BIDS.

In the March number of THE METAL INDUSTRY there appeared a half-page advertisement soliciting bids on material required for 12,000 automobiles, the material being required for the 1910 production schedule of the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., also with factories at Newcastle, Ind., and Pawtucket, R. I. The advertisement related to a dozen different kinds of metal goods ranging from 200 tons of aluminum castings to 12,000 copperized oilers and with the bids also advertised elsewhere for iron material amounted to several millions of dollars. This unusual practice of a private concern getting current costs through trade journal advertising was the idea of A. R. Gormully, purchasing agent of the Maxwell-Briscoe Motor Company, and he carried out his idea in a liberal fashion by taking conspicuous display advertisements rather than following the government method of inconspicuous, undisplayed spaces.

The results from Mr. Gormully's method of getting bids have been extremely satisfactory and the purchasing department of the company believes that it has reached a greater number of possible bidders and secured a better line on the market rates for automobile material than could have been obtained by any other known means of getting bids for supplies. The cost by this method was infinitesimal, considering the audience that was addressed. To reach the same number of manufacturers by circular letter the postage alone would have been ten times the amount spent for the advertising, saying nothing of the time and labor of preparing, addressing and issuing the letters.

At the same time that Mr. Gormully placed his advertisement for bids in THE METAL INDUSTRY he advertised in two other trade journals, each relating to the iron industry, the advertisements being similar to the one placed in this journal but occupying more space and also calling for bids on iron and steel in a greater variety of forms. THE METAL INDUSTRY relates to metals other than iron or steel. Up to April 8th the number of replies received from the three different sources, viz.: THE METAL INDUSTRY and our esteemed contemporaries *The Iron Age* and *The American Machinist* were as follows: General replies mentioning no paper, 112; replies from *The Iron Age*, 66; from THE METAL INDUSTRY, 54; from *The American Machinist*, 49; total, 281. The replies from THE METAL INDUSTRY were from a wide range of territory, two coming from England, containing bids for aluminum castings. It is needless to say that Mr. Gormully has not had to repeat his advertisements for lack of results.

MONTHLY MEETINGS OF PLATERS.

At the first regular meeting of the National Association of Electroplaters of the United States and Canada held April 10, 1909, at the Hotel Chelsea, 222 West 23d street, New York, it was voted to hold regular meetings on the first Friday of each month at 8 p. m. at the above-mentioned hotel.

At this meeting the Association designated THE METAL INDUSTRY as its official organ.

CRITICISM AND COMMENT
WE CORDIALLY INVITE READERS' OPINIONS AND CRITICISMS OF ALL ARTICLES
PUBLISHED IN THE METAL INDUSTRY. SUGGESTIONS WELCOME.

STANDARD METHODS FOR THE ANALYSIS OF BRASS.

To the Editor of THE METAL INDUSTRY:

It is a pleasure to note that a movement is actually on the way to obtain official methods for analysis of brass. It is a movement that is gradually taking place in every line of chemical industry, and a free discussion, if undertaken, in an impersonal manner, will in itself be a liberal education. The time has passed when a chemist devises some special method of analysis, and then hides it like a candle under a bushel, thinking it is his own personal property, and that no one has a right to use it but himself. No man, no matter how much his education has cost him, could have obtained it were it not for the assistance of those around him, as well as those who have done their work and passed away. The wolf cry of commercialism that arises whenever such a movement is on foot can well be met by the statement that an analyst is to the chemist what a draughtsman is to the civil engineer or architect. The chemist must interpret the results found.

I was rather disappointed to note in your January number what seemed to me rather an unfair criticism of Mr. Hall's "Complete Brass Analysis." If the critic had had much experience in publishing he would have learned what a stubborn article the proofreader is, and he might have passed charitably over the error where the word ferrous is used and the formulae for ferric oxide given. Some time ago one of our noted scientists had to make a correction in three different issues of the paper before being set right, and was at last forced to call attention to the psychological phenomena that made the printer insist on making the same error.

In passing and referring to method of drying the cathodes, it might be well to call attention to the classic authority, Dr. Classen, where he instructs that the cylinder should be washed in cold water, and then three times in pure alcohol, and dried for five minutes in an air bath of 70° to 90°. It is then allowed to cool in a desiccator. Any one who has tried to dry a cathode in the flame will have noticed the tendency for oxidation, and it is on this account that it is universally discarded by those who must check other laboratories on different samples within 0.20% on material running from 99.5 to 99.9 per cent. copper.

There is another thing to be remembered. We are prone to condemn some method, because, not having made a careful study of all of the conditions, we make slight modifications, and then blame it on the method because our results are wrong. This is seen in a discussion of the cyanide, iodide and the electrolytic methods for the determination of copper. Personally, I find that I can get equally good results with all three methods, if I observe all of the conditions. Most of the errors of the electrolytic method are positive, while those of the iodide are compensating. This is due to the impurities which the precipitated copper may contain, or to the impurities in the reagents that may set iodine free.

But on the other hand it is difficult to get all of the copper absolutely precipitated. It is well in making any determination to run a standard using the same amount of reagents. This is especially true of the cyanide method, when the same amount of ammonia, the same volume of liquor, and the same end tint must be observed. For my part, I uphold Mr. Hall in his distillation method for arsenic, though I use a modification which it may be of interest to give. It is practically that set forth by Dr. Odling.

I usually prepare a batch of flasks for distillation, as it saves time. My method is to dissolve about five pounds of ferric chloride in four liters of water. Then I take an aliquot portion containing a quantity of iron equal to twice the amount of copper to be acted upon. This I evaporate down in the flask to a syrup with about a gram of ferrous sulphate. This is done to break up any nitrates that might be present in the chloride, and to get rid of any arsenic. Now weigh off 5 grams of the copper into the flask, add 100 cc. of HCL and distill. If the amount of arsenic is large it is well to redistill. Most of the other oxidizing reagents used besides ferric chloride react on the HCL setting free chlorine which interferes later on. The distillate is almost neutralized with ammonia, and finished with bicarbonate of soda, and then titrated with decinormal iodine solution in the presence of starch. If the amount of arsenic is small, I precipitate the arsenic out as sulphide, observing the usual rules as to settling. Then filter on a small filter, washing well and dissolving the arsenic in a mixture of ammonia and ammonium carbonate, acidify with acetic acid, and titrate with a centinormal solution of iodine in the presence of acetic acid solution of starch. It is well to run a blank in either case. The factor in the last case is 0.00023. Prof. Gibbs suggests that the distillate should be put in a Marsh apparatus, and the resulting mirror be compared with a standard set of mirrors. This, of course, would be similar to the colorimetric method of steel analysis. I have used the distillation method as given for over eight years, and must say that I have found it accurate and reliable when compared with results found by other chemists using other methods. Consequently, I do not hesitate to recommend it.

The following is a short outline for an analysis of alloys containing tin, lead, copper and antimony. Take one gram of the finely divided alloy and dissolve in a boiling solution of about 75 cc. of a solution prepared as follows: 20 grams of potassium chloride in 500 cc. of water, 400 cc. of concentrated hydrochloric acid, and 100 cc. of nitric acid of 1.40 sp. Gr. After the solution has taken place, evaporate to about 50 cc. Cool by placing the beaker in cold water, when most of the lead will crystallize out as chloride, then add with constant stirring 100 cc. of 95% alcohol. After permitting the solution to stand for half an hour, filter and wash by decantation with a mixture of four parts alcohol and one part hydrochloric acid and wash the paper twice with the same mixture. Wash the lead chloride on the filter into the beaker, and wash the filter paper several times with boiling water, allowing the washings to flow into the beaker containing the chlorides. Then wash twice with a hot acid solution of ammonium acetate, heat the beaker until the lead is in solution. Add 15 cc. of a saturated solution of bichromatic potassium and warm on a hot plate until the precipitate is of a bright orange color. Use a Gooch crucible for filtering, observing all of the precautions given by Fresenius. *

Evaporate the filtrate from lead chloride to dryness on a water bath, and add about 10 cc. of a solution of potassium hydroxide made by adding 1 gram of potassium hydroxide to 5 cc. of water. In a few minutes add 20 cc. of peroxide of hydrogen, heat gently for 20 minutes, add 10 grams of oxalic acid and 10 grams of ammonium oxalate in 200 cc. of water. Heat to boiling, and pass in hydrogen sulphide gas with the solution just below the boiling point for 45 minutes. Filter at once, washing with hot water. After expelling the hydrogen sulphide gas by boiling, electrolyze over night with half an ampere current. In the morning the solution will usually become alkaline, and it may be taken for granted that the tin is all precipitated. Wash the cone in cold water and alcohol and dry as in the case with copper. Read Classen for more details as to the electrolysis of tin.

*Fresenius Quantitative Analysis.

Now take the precipitates of antimony and copper sulphides on the filter and wash back with the least amount of water possible, and treat with about 10 cc. of potassium hydroxide solution (1 to 5) and let stand on the warm bath until the copper remaining is absolutely black, then filter through the same paper from which it was washed into a 12-oz. flask. The copper remaining on the filter can be dissolved with nitric acid and determined by either the cyanide, iodide or electrolytic methods.

The solution of antimony sulphide in potassium hydroxide should not exceed 5 cc. in volume. To this add one gram of potassium chlorate, 50 cc. of concentrated hydrochloric acid, and boil until the solution is colorless and the free chlorine has been driven off. If any sulphur separates out, filter through an asbestos filter into a similar flask, washing out the original flask with hydrochloric acid, cool, add 1 gram of potassium iodide, 1 cc. of hydrochloric acid and titrate with a decinormal solution of sodium thiosulphate, 1 cc. of which is equal to 0.006 gram of antimony.

(Method of G. W. Thompson.)

For zinc, it is my custom to take one gram of the material in a casserole, and dissolve in 15 cc. nitric acid saturated with potassium chlorate. Evaporate to dryness so as to get rid of any nitric acid. Cool and add 7 grams of ammonium chloride and 15 cc. of ammonia, 25 cc. of water and boil for about one minute, breaking up any lumps. Filter to get rid of any iron or manganese, washing with hot water containing ammounium chloride. Add 20 cc. of hydrochloric to the filtrate and 20 to 40 grams of test lead, boil until all of the copper is precipitated. Aluminum foil can be used instead of the lead. I now neutralize without filtering with ammonia and then add 10 cc. of hydrochloric acid in excess. Heat in excess. Heat nearly to boiling and titrate with potassium ferrocyanide, using uranium acetate as an indicator. The ferrocyanide method is too well known to require any detailed description.

The iron can readily be obtained by dissolving the precipitate on the filter from the zinc filtrate with hydrochloric acid reducing in a boiling solution with stannous chloride, cooling and then taking up the excess of tin chloride with mercuric chloride. Titrate with potassium bichromate, using ferricyanide as an indicator. As long as there is any ferrous salt remaining a small drop of the solution will give a blue color if tested on a porcelain plate with a drop of potassium ferricyanide. When the oxidation is complete no blue color will be seen. Use a solution of bichromate in which 1 cc. equals 0.005 gram iron.

F. B. FLINN,
Chemist and Assayer,
111 Passaic Ave.

Newark, N. J., March 10, 1909.

Shop Problems

IN THIS DEPARTMENT WE ANSWER QUESTIONS RELATING TO SHOP PRACTICE OF THE METAL INDUSTRY. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

ALLOYING

Q.—Can you tell me of some white metal, that can be cast in a brass mold and has the following qualities? Must be of low cost, light in weight, must not crack and not be affected by the weather.

A.—Horsehead zinc will more nearly meet your requirements than any alloy that we know. You might try an alloy, however, composed of 90 per cent. horsehead zinc and 10 per cent. of pure aluminum.—J. L. J.

CASTING

Q.—Would appreciate it very much if you will answer the following questions: Is 20 per cent. German silver too strong in nickel for highly polished castings? I have made some small castings weighing about ¼ pound a piece and find them porous and not polishing clean. Would the addition of tin and aluminum improve the metal? Are heavier gates than are used for yellow brass necessary? Should molds be skin dried?

A.—The addition of four ounces of aluminum to each 100 pounds of your metal will prevent porosity. No material advantage would be gained by the use of tin, while it would add to the cost of the mixture. Heavier gates must be used than are used for yellow brass. The gates should have a section equal to that of the casting. As 20 per cent. German silver has a rather high melting point, the use of skin-dried molds is a decided advantage, and the metal does not set so quickly and is less liable to be porous.—J. L. J.

Q.—We are having considerable trouble of late with our brass castings and are losing a large percentage of the heats. Pieces that weigh from five to 20 lbs. are causing the most trouble. In machining the castings they show open and porous in spots. They also have too much shrinkage, shrinking away from the gate and leaving a hole in the casting, the center of hole showing a reddish color. In some heats we get a good and a bad casting on the same gate, poured from the same crucible. What do you think the remedy is?

A.—The fact that you get a good casting and a bad one on the same gate shows that your trouble is not in the metal used, but in the gating. Molders who are accustomed to cast iron usually gate brass in a similar manner and the result is shrink spots and porous castings. You should make your gates very heavy, in fact of the same depth as the casting's thickness, but of course they do not have to be as wide. In the case of the good casting and bad casting on the same gate, the good one probably received the hottest metal and this kept the sprue open and kept feeding the casting, making it solid, while in the other casting the metal in the sprue set and the casting could not be fed.—J. L. J.

CEMENTING

Q.—We should be glad to learn if your good selves or any of your correspondents know of a metal called "Spence's Metal" and where we can obtain supplies of same.

A.—The metal known as "Spence's Metal" is not really a metal of itself. It is composed of the sulphides of iron, zinc and lead which are used in varying quantities, and are fed into a bath of melted sulphur. Sulphur absorbs the metal sulphides, and forms a thick homogeneous mass, which melts at a low temperature, and hardens on cooling like cement. We believe it is used for making seals for rubber or glass connections in various chemical processes. We are at present unable to advise where you can get this material, but would suggest corresponding with some chemical house.—Ed.

DEOXIDIZING

Q.—Supposing that small percentages of phosphorus, silicon or aluminium were not prohibited in the finished alloy, would it not be advisable to use one of the deoxidizers and cast in an iron mold? If so, what proportion would you add? What mixture would you recommend (either bronze or brass) for tubes which have to stand a steam temperature of 600° F.?

A.—The amount of any deoxidizer that should be used in a given mixture depends on the amount of oxides present. If the materials are of good quality and the melting carefully done, deoxidizers can usually be dispensed with. If used, just enough of the deoxidizer should be added to reduce the oxides and leave no excess of deoxidizer in the metal (usually a few hundredths

of one per cent. is enough). If the question of cost is not one of primary importance, no better alloys could probably be recommended for tubes which have to stand a steam pressure of 600° F. than some of the alloys used for resistance wires. "Constantan" is one of the best of these. It consists chiefly of nickel and copper and contains no zinc and but little iron. Bassé & Selvé, Altena, Germany, are the makers of "Constantan."—J. L. J.

FINISHING

Q.—We are interested to know how to produce the genuine gun metal finish by plate process. We are anxious to get a good, hard wearing finish as close to black oxidized in color as possible. We would like to get a finish to wear as well as a good nickel plate.

A.—A solution that has given excellent results for a dark gun metal finish is made up as follows: Dissolve by the aid of as little boiling water as possible 8 ounces of white arsenic in 4 ozs. of 98% caustic soda. When dissolved, add 1 gallon of muriatic acid, then add 8 ounces of single sulphate of nickel and mix thoroughly; use anodes of nickel. The voltage should be from 2 to 3, the amperage low on account of the large amount of free acid and the rapidity of the deposit. The articles must be very clean. It is advisable to give all articles a momentary flash in the regular nickel bath; this makes a good base for the gun metal finish. Articles bright acid dipped give an excellent color; of course the finish depends upon the lustre before plating. A five-minute deposit is all that is necessary, and the deposit will be found harder than nickel. For lacquer use ½ French varnish and ½ gun cotton, with a thinner of equal parts of amyl acetate and fusel oil. A little aniline green should be previously dissolved in fusel oil or amyl acetate and sufficient added to give the lacquer a faint greenish tinge. It will be found by this method that the gun metal finish will have a richer appearance than when the regular lacquers are used, and it will also avoid prismatic colors that usually appear upon this finish when lacquered in the usual manner.—C. H. P.

Q.—I have brass chandeliers to steel plate, and I wish you would help me out as to how to make a (steel solution), good and durable, as this work is to be guaranteed. How do you make colonial brass finish?

A.—For a plated steel finish, prepare a solution consisting of 1 pound of white arsenic powdered and ½ pound caustic soda in each gallon of water. Dissolve in hot water and allow to cool, use sheet iron anodes with a fairly strong current. See that your work is nicely polished if you want a good lustre. Lacquer the articles in the usual manner. Colonial brass is also known as brush brass or old brass finish. To produce this finish the articles should be polished with tripoli in the usual manner, then cleaned in the usual potash and cyanide dip; then the dead lustre is produced by a slow running brass wire scratch brush of the crimped wire variety. Use a little pumice stone mixed with water and apply to the articles; then brush lightly and an even lustre will be obtained; wash well, dry out and lacquer with a heavy dip lacquer.—C. H. P.

Q.—You will help me out a great deal if you will publish the following: A formula for a Butler finish; and is a mercury dip good before silver plating on all articles?

A.—The Butler finish is produced as follows: Silver plate the articles in the usual manner; then scratch brush them with a fine, soft, steel wire scratch brush 5 inches in diameter, 4 rows wide, and run at about 800 revolutions per minute. First go over the articles lightly with the brush, then apply a little powdered pumice stone mixed with water, and apply to the articles; go over as lightly as possible to produce the dead effect, dry out in the usual manner, and lacquer with a transparent lacquer. Sometimes the French gray is termed the Butler finish, owing to a darker tone. The articles are oxidized in the liver of sulphur hot dip, and then scoured out with a slow running tampico wheel and pumice stone, and then gone over with the wire brush as mentioned above; afterwards the articles are lacquered. The mercury dip produces a more adherent deposit upon many metals, but many times the mercury is replaced by a light nickel deposit, and then the quicksilver strike is used. Upon iron or steel or lead alloys the articles must be lightly coppered or brass plated to make the mercury dip effective. In silver plating steel knives and forks the silver is deposited directly upon the steel first, by the aid of from two to three silver strikes, and then placed in the regular bath.—C. H. P.

MIXING

Q.—Will appreciate it if you will publish in your next edition the mixture of brazing solder and how to make it?

A.—The mixture used for brazing solder is: copper, 50 per cent., zinc 50 per cent. The best obtainable brands of copper and zinc should be used and care exercised not to overheat the metal or scruppy solder will result. The molten alloy is poured in a thin stream into a tub of clean water placed about 10 feet below the crucible, whereupon it breaks up into globules which are washed free from oxide and dried. The solder is then ready for use.—J. L. J.

Q.—Will you please advise through your regular columns what is considered the best mixture for overhead trolley wheels in the 6 in. and 4 in. sizes? The most desirable quality is long life. These are run against a copper trolley wire, and it is desirable that they be of such a composition that they will not wear the wire too greatly, and at the same time shall have long life themselves.

A.—In reference to the best mixture for overhead trolley wheels in 4 and 6-inch sizes we recommend you to try the following:

Copper	94
Tin	5
Silicon	1

In the above mixture the silicon is best introduced by means of the alloy silicon copper.

PLATING

Q.—My cyanide copper bath stands at 20°Bc. and plates a hard red in spots and these spots do not finish a good black when oxidized. What is the trouble?

A.—Reduce your copper bath to 10 degrees Be. with water, then add 2 to 3 ozs. of bisulphite of soda to every gallon. This will produce a nice soft red that will oxidize readily.—C. H. P.

Q.—We have added 5 lbs. of copper sulphate by mistake to our 300 gallon tank of nickel solution. Can you tell us how to treat it to eliminate the copper?

A.—Acidulate your bath with 20 ozs. of oil of vitriol dissolved in water, stir well in the bath. Then add all the clean sheet or wrought iron that can be conveniently placed in the tank at one time. Do not apply the current; the iron will take the copper out of the bath. This will be noted by the iron becoming a copper color. Continue this as long as any copper remains in the bath. Afterward if the bath is too radically acid to give good results, for every ounce of oil of vitriol used add 3 ozs. of 26 per cent. water ammonia. This will neutralize the free acid added to the bath.—C. H. P.

RUMBLING

Q.—We wish to receive information as to the best method of rumbling cast iron light castings. The method we are now using is with water and sand, but we have many breakages in our cast iron clock frames.

A.—Rumble in an egg-shape dry rumbler with good exhaust connected, to carry away dust through trunnion. The principal trick is in properly packing light castings and running at a speed that will create a rubbing effect rather than violent tumbling. If castings have hollows, use plenty of so-called shot-iron (spillings from molder's ladles). Exact directions for packing and speed cannot be given but will have to be determined by experimenting, as they vary considerably with different shapes of castings, but pack as full as the castings will allow without breaking of their own weight on each other.

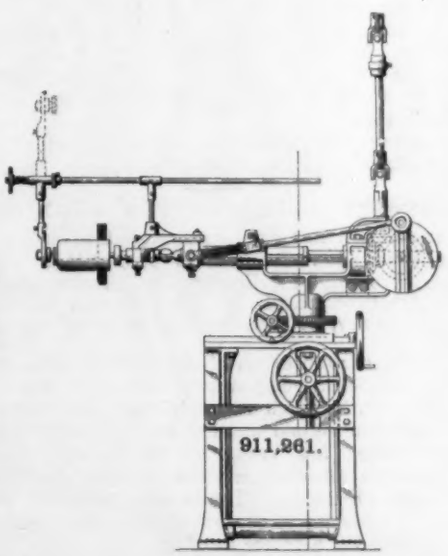
Round mills do not give as good results on the light castings, while the square or hexagon are altogether too destructive to the work. If very thin work is desired, such as for fine plating, the sand-blast tumbling barrel is ideal.—W. L. C.

PATENTS

REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

909,283. January 12, 1909. ALLOY. Joseph F. Clapp, Los Angeles, California. An alloy of steel, of great hardness, toughness, tensile strength and resistance to corrosion. This alloy comprises iron, iridium, platinum, copper and nickel, the percentage of iron from 40 to 90, of iridium from 1 to 30, of platinum from 0.2 to 10, of molybdenum from 1 to 15, of copper from 0.5 to 15, and of nickel from 0.5 to 15.

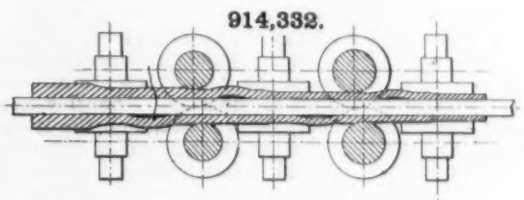
911,261. February 2, 1909. BUFFING MACHINE. Ernest E. Perrers, Buffalo, New York. A buffing machine, shown in cut, so constructed that articles may be buffed or polished expeditiously and thoroughly with a minimum expenditure of power, which can be readily adjusted to articles of different shapes and sizes, and which has a comparatively large range of adjustment so that articles varying in length can be buffed by the same machine.



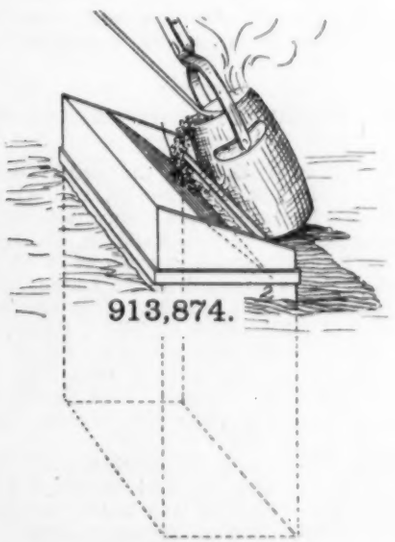
912,199. February 9, 1909. TROLLEY WHEEL. Leo O. Staut, Dublin, Ind. A trolley wheel of such construction as shown in cut, to provide for the automatic replacement of the wheel upon the wire conductor and the centering of the same. These results are attained whether the car is going backward or forward and without stopping the car. The wheel has at each side a cone wheel idler provided with intersecting spiral grooves running in opposite directions. The side walls of said grooves having inward deflecting extensions at the points of intersections, said cone wheel has at the large end an eccentric flange which has a groove communicating with the main spiral groove. The result of these grooves, etc., is if the wheel slips off the wire the grooves hold the wire still in contact, and lead it back to the eccentric which in turn directs it back to the main wheel groove.

913,275. Februaary 23, 1909. PROCESS OF DETINNING. Harry M. Fernberger, Dollar Bay, Mich., and Wm. W. Murray, Philadelphia, Pa. A process for freeing tinplate clippings, tinned milk and tomato cans and any other tin scrap from their tin. A solvent is used that dissolves the tin and has no effect on the iron or steel. The solvent used is carbon tetra chlorid (CCl_4) which is anhydrous, insoluble in water (H_2O), dissolves chlorin gas (Cl_2), will not dissolve ferric chlorid ($FeCl_3$), but dissolves greases and fats.

914,332. March 2, 1909. MANUFACTURE OF TUBES. Otto Briede, Bemath, Germany. A method of producing thin walled tubes from a hollow billet, by pushing one side of the billet away from the mandrel during the reducing and elongating action on the opposite side of the billet. As shown in cut, there are a series of stands or pairs of rolls arranged for continuous action, i. e., at such a distance apart that the billet will be caught by one pair before it is freed from the preceding pair.



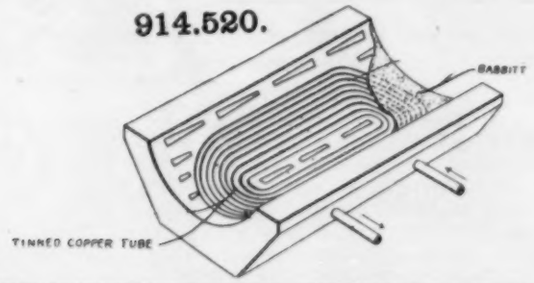
913,874. March 2, 1909. PROCESS OF TREATING AND UTILIZING SULLAGE FROM MOLTEN METALS. Wm. B. Carpenter, Connecticut, assignor of one-half to A. L. Haasis, Brooklyn, New York. A process as illustrated in cut, of treating and utilizing sullage from crucibles containing molten metal, by skimming it into a body of water for cooling and separation. The inventor claims a saving in time, labor, charcoal and metal.



914,520. March 9, 1909. BEARING. Frederick W. Solmon, Burlington, Iowa. A bearing having a cooling coil inserted in such a manner as to render it impossible for a heating insulating film of oil to get between the babbitt metal in the bearing and the water cooled surface of the coil. As shown in cut, a coil of thin copper tube with the outside tinned, is fitted into a recess cut in the bearing box. The babbitt metal is poured into the box and

will become soldered to the tube by the tinned surface. Water is then circulated through the coil, making a cooled bearing at all times.

914.520.



915,727, March 23, 1909. Process of Making Castings of Aluminum and Aluminum Alloys. Earl Blough, Parnassus, Pa., assignor to Aluminum Company of America, Pittsburg, Pa. A process for the casting of aluminum and alloys of aluminum with a view to increase the strength and toughness of the metal. A mixture of 15 to 20 per cent. or so of finely ground carbonaceous materials with ordinary foundry sand is made, and as this material conducts the heat away rapidly from the casting, the metal is chilled, thereby increasing its tensile strength. The carbonaceous material found most advantageous to use is composed of 50 parts good petroleum coke and 25 parts of electric light carbon or similar material, ground fine and mixed together and then thoroughly incorporating them with 25 parts of coal tar pitch in a suitable kneading machine.

This same inventor has been granted a patent, 915,728, on the use and application of a mold of the above mixture.

Associations and Societies

DIRECTORY OF AND REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

AMERICAN BRASS FOUNDERS' ASSOCIATION.

President, Charles J. Caley, New Britain, Conn.; Treasurer, John H. Sheeler, Philadelphia, Pa.; Secretary, W. M. Corse, Detroit, Mich. All correspondence should be addressed to the Secretary, W. M. Corse, 123 Palmer Avenue, East, Detroit, Mich. The objects of the Association are for the educational welfare of the metal industry. Annual convention with the American Foundrymen's Association the latter part of May each year in a succession of cities, as invited. The 1909 Convention will be held in Cincinnati, Ohio, May 18-20.

Secretary Corse reports that the following have applied for membership in the Association:

South Machinery Co., Atlanta, Ga.
S. Birkenstein & Sons, Chicago, Ill.
Mr. P. P. Cope, Dayton, Ohio.
Cadillac Motor Car Company, Detroit, Mich.
Mr. C. F. Harvey, Detroit, Mich.
Michigan Smelting & Refining Co., Detroit, Mich.
Mr. Frank Comstock, c/o Norwalk Brass Co., Norwalk, Conn.

He also says that the preliminary work on the standardization of methods for brass analysis is progressing very satisfactorily.

NATIONAL ASSOCIATION OF BRASS MANUFACTURERS.

President, Joseph H. Glauber, Cleveland, Ohio; Commissioner, William M. Webster, Chicago, Ill. All correspondence should be addressed to the Commissioner, William M. Webster, 1110 Schiller Theatre Building, Chicago, Ill. The objects of the Association are to promote in all lawful ways the interests of firms engaged in the manufacture of brass goods. Meets every three months. Each meeting fixes the place and date of the meeting to follow, consequently there is no stated place. It has been customary for the Association to hold its Annual Meeting in New York City, but the last meeting was held in Philadelphia. The Semi-Annual Meeting is generally held at Atlantic City or some other seacoast town.

Commissioner William M. Webster has the following to report regarding the meeting held at Hotel Jefferson, St. Louis, on the 17th of March. We had a very large attendance, and some very interesting papers were read, among them one from Mr. N. O. Nelson, of St. Louis, written while on his farm in Louisiana. This was not the annual meeting, so there was no election of officers, but aside from handling the regular course of business, possibly one of the most important things decided was the much discussed and debated question in the past as to whether the water brass goods' manufacturers should hold to and use the old form of listing their goods by the dozen instead of by the piece. This matter was referred to the St. Louis meeting as a special order of business to take up there and decide and it was finally settled, and almost unanimously so, that we would adhere to the present form of listing goods by the dozen. The lists, however, will all be changed, some lowered, some advanced. It is really a revision and adjustment of lists, bringing them up to the present modern method of costs and manufacture.

The meeting was in session two days and adjourned to meet in Buffalo, N. Y., on May 18 and 19.

NATIONAL ELECTROPLATERS' ASSOCIATION.

This association has now been organized and a constitution has been adopted which is published in full below. Charles H. Proctor, of Arlington, N. J., is president, Nathan E. Emery, treasurer, and B. W. Gilchrist, Box 26, Woodhaven, L. I., is secretary, to whom all correspondence should be addressed.

Two well attended meetings of those interested in the forming of this organization have been held since the last issue of The Metal Industry, in which was published a full account of the first meeting. The second meeting was held March 19, 1909, at the Astor House, New York. At this meeting the Constitutional Committee reported, and the proposed constitution was discussed section by section. The meeting adjourned after adopting the greater portion of the constitution, the remainder being laid on the table for a future meeting.

The third meeting was held April 10, at the Hotel Chelsea, New York, when the constitution was adopted, and the association was given actual existence and a good launching with the following list of charter members:

C. S. Barber, Jr., Theodore Bartlett, Hugh Baxter, E. Blassett, Benj. Brown, Percy S. Brown, William Bryer, W. E. Churchill, Royal F. Clark, Fred. C. Clement, Herbert W. Cummings, E. B. Davidson, Otto Demowitz, Joseph Dimes, R. Downey, C. Dreher, Frank Duffy, Fred Eberwein, N. S. Emery, John J. Farmon, Ed. W. T. Faint, C. O. Field, John H. Flanagan, Foreman Plater, c/o J. E. Margott & Co., Foreman Plater, c/o Lockwood Lock Co., Wm. G. French, F. J. Frost, Louis Gaenicke, John E. Grant, B. W. Gilchrist, A. D. Havens, Oscar A. Hillman, J. F. Hubbs, J. M. Kerhart, P. H. Langdon, Wm. Lorch, James Meldrum, Wm. McConnell, W. C. Mills, J. F. Meinke, Harvey Miller, Edward E. Newton, A. J. Piper, Chas. H. Proctor, L. A. Peterson, Wm. Reina, Wm. Schneider, H. H. Smith, Franklin Sheldon, John W. Slattery, R. H. Sliter, F. H. Speary, G. O. Thompson, Geo. Whalen, C. D. White, E. Willmore, E. D. Van Arsdale, Wm. Voss.

CONSTITUTION OF THE NATIONAL ELECTROPLATERS' ASSOCIATION OF THE UNITED STATES AND CANADA.

ARTICLE I. NAME, OBJECT AND LOCATION.

Section 1. The name of this association shall be The National Electroplaters' Association of the United States and Canada.

Section 2. The object of this association shall be the advancing and dissemination of knowledge concerning the art of electrodeposition of metals in all its branches, including the finishing of metals generally, and to maintain an employment bureau for the benefit of members and the trade at large. A bureau of information and a laboratory equipped for research work will be maintained by the association and meetings will be held for the purpose of presenting papers upon appropriate subjects, as well as by the publication of such literature as may be deemed advisable.

Section 3. The location of the headquarters of this association shall be New York City.

ARTICLE 2. MEMBERSHIP.

Section 1. The membership of the association shall consist of three classes, to be called, respectively, active, associate and honorary.

Section 2. Active Members: Supervisors, general foremen, foremen of electroplating and finishing departments.

Section 3. Associate Members: Any persons who are actively interested in the art of electrodeposition.

Section 4. Honorary members: Any persons whose knowledge or services are pre-eminently valuable to the association.

Section 5. Membership Badge.

ARTICLE 3. OFFICERS.

Section 1. The officers of this association shall be a president, ten vice-presidents, a secretary, and a treasurer.

Section 2. The ten vice-presidents shall be selected from their respective sections as follows:

(a) The New England States (except Connecticut).
(b) Connecticut.
(c) New York.
(d) New Jersey.
(e) Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia.
(f) Illinois, Michigan, Ohio, Indiana.
(g) Missouri, Kansas, Colorado, New Mexico, Utah, Arizona, Nevada, California.
(h) Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Idaho, Nebraska, Montana, Wyoming, Washington, Oregon.
(i) North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas, Kentucky, Tennessee, Indian Territory.
(j) Canada.

Section 3. The president, secretary and an advisory board of five members elected by the association at each annual convention shall constitute the executive board of the association.

ARTICLE 4. CONVENTIONS.

Section 1. This association shall meet in convention each year at the time and place that the members may decide upon at the previous annual convention.

Section 2. During the convention meetings shall be held for the transaction of business and for the purpose described in Section 2 of Article 1.

Section 3. .... members shall constitute a quorum.

ARTICLE 5. AMENDMENTS.

Section 1. This constitution may be amended at any annual convention of the association by the two-thirds vote of the members in good standing present. In case a quorum be not present the secretary shall within thirty days of adjournment submit the proposed amendment to the members for ballot by mail.

Section 2. Any proposed amendment endorsed at any time by a majority of the executive board shall be submitted by the secretary to the members for ballot by mail.

BY-LAWS.

Section 1. The officers of the association shall be elected by ballot by a majority vote of the active members in good standing at the annual convention.

Section 2. All officers of the association shall hold office for one year from the adjournment of the annual convention at which they are elected and until their successors shall have been elected. In event of a vacancy occurring in any office during the year the executive board shall fill the vacancy for the unexpired term.

Section 3. The president shall have general supervision over the affairs of the association, shall preside at all meetings, and shall perform such duties as usually devolve on a presiding officer.

Section 4. The senior vice-president shall perform the duties of the president in the absence of the latter.

Section 5. The vice-presidents shall act as chairmen of all meetings held in their respective sections, such meetings to be subject to by-laws draughted by each section and approved by the executive board of the National Association.

Section 6. It shall be the duty of the secretary to keep the records and conduct the correspondence of the association, to send out all notices of meetings and other literature and provide a report at each annual convention of the proceedings of the past year, including a report of the membership and of the proceedings of the executive board. He shall collect all moneys due the association and issue receipts for the same and turn them over to the treasurer, receiving receipts from him.

Section 7. The treasurer shall have charge of all moneys and pay all bills which have been approved for payment by the president. He shall keep regular accounts of all receipts and expenditures and shall report at the regular annual conventions. He shall also give a bond for the faithful performance of his duties as determined by the executive board.

Section 8. Meetings of the executive board may be called by the president or by any three members of the board and five members shall constitute a quorum.

Section 9. No obligations shall be incurred in the name of the association except upon written authority of the president.

Section 10. The president shall appoint an auditing committee, consisting of three members, who shall audit the accounts of the secretary and treasurer each year.

DUES.

Section 11. The annual dues for active members shall be $5.00 per year and for associate members $3.00 per year.

Section 12. Members whose dues are not paid within three months after the adjournment of the annual convention shall be considered in arrears.

Section 13. Only members who are not in arrears shall be considered members in good standing.

Section 14. Members whose dues for the previous year remain unpaid at the beginning of any fiscal year shall be dropped. Dropped members may be reinstated upon application, accompanied by a remittance of all moneys due the association. All such applications shall, however, be subject to the approval of the executive board.

Section 15. No dues shall be collected from honorary members.

APPLICATION FOR MEMBERSHIP.

Section 16. All applications shall be made to the secretary on an official form furnished by him, this form to be filled out as directed and endorsed by the applicants present or former employer and a member (in good standing) of the association.

Section 17. On the first day of each month the secretary shall mail each member of the executive board a list of the applications for membership received during the preceding month. If within two weeks he shall have received a written protest from two or more of the members of the executive board against the election of one and the same applicant, such applicant shall be considered rejected, otherwise the applicant shall be considered elected and the secretary shall enroll him as a member and at once notify him of his election and send him a bill for dues. A certificate of membership shall be sent to each member on notice of his election.

ORDER OF BUSINESS.

Section 18. The order of business to be observed at annual convention shall be as follows:

(1) Reading of minutes of last meeting.
(2) Announcement by the president of special committees.
(3) Report of officers and standing committees.
(4) Report of special committees.
(5) Unfinished business.
(6) New business.
(7) Election of officers.

AMENDMENTS.

Section 19. These by-laws may be amended by a two-third vote of the members in good standing present and voting at any regular meeting.

PERSONALS

ITEMS OF INTEREST TO THE INDIVIDUAL.

JOHN G. NIEDERER.

JOHN G. NIEDERER.

A Veteran Art Metal Worker.

Mr. John G. Niederer, the subject of this sketch, was born in New York City and educated in private and public schools in that city. He was apprenticed to Tiffany & Company when 17 years of age to learn the art of turning and spinning. He remained with the above concern until 21 years old and assisted in making the following historical articles: Silver hollowware presented to the Alabama Commission. Solid silver illuminating fixtures for the Mackay house. The Palma Trophy. Silver and copperware for the Paris Exposition, which brought to this country the decoration of The Legion of Honor for several officials of the Company. The Neil Cullen Bryant Cup, now in the Metropolitan Museum of Art.

After leaving Tiffany's he took charge of the machine room for Samuel Kirk & Company, of Baltimore, Md., who were just starting to manufacture silverware by machinery. (See article by Mr. Niederer in another column of this number.) He soon became expert in the chasing and chiselling of silverware and taught a class in repoussé and brass hammering for several years. After engaging in business for himself for a number of years, he relinquished it to become general superintendent of the Carlstadt, N. J., works of S. Klaber & Company. He formed, while with the company, a building and loan association, which was remarkably successful and is still in a flourishing condition. Mr. Niederer received from the World's Fair, held in Chicago 1893, a diploma of honorable mention from the Board of Lady Managers for the design and execution of S. Klaber & Company's exhibit. After 12 years' faithful service with this company, he again engaged in a private enterprise, which not being in the metal line with which he was most familiar, proved a failure.

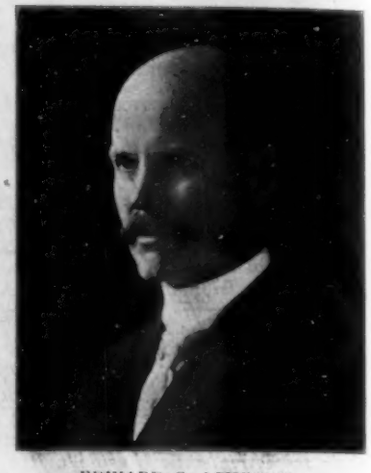
After several years of varied experience we find Mr. Niederer located in Philadelphia in charge of the Pennsylvania Bronze Company. In later years Mr. Niederer has several times been honored with public office in his home town, East Rutherford, N. J. He was also one of the organizers of the East Rutherford Building and Loan Association. While Mr. Niederer has held important and naturally remunerative positions, his continual experiments for better methods have proved costly, and he has at various times, when out of executive positions, been compelled to take his place at the bench or lathe beside his former apprentices, cheerfully and resigned, always feeling that he was still learning and helping in the good work of progress in America's industrial march.

R. H. Sliter has accepted a position with the Schroeder Lamp and Supply Company, Jersey City, N. J., as foreman plater. The Schroeder Company are manufacturers of railroad and marine lamps.

H. S. Leggett, an expert plater and metal finisher, who for many years was with the Whiting Manufacturing Company and the Gorham Manufacturing Company, has taken a position with Edward Miller & Co., Meriden, Conn., where he will have charge of the plating, gilding and all of the different metal finishing departments. Edward Miller & Co. are large manufacturers of a great variety of metal goods.

Charles J. Caley, general manager, Russell and Erwin Manufacturing Company, is spending this month at Atlantic City.

EDWARD G. ACHESON.



EDWARD G. ACHESON.

The University of Pittsburg on Friday, Feb. 12, honored Mr. Edward G. Acheson, president of the International Acheson Graphite Company, of Niagara Falls, N. Y., by conferring upon him the degree of Doctor of Science. The convocation was held in Carnegie Music Hall and was in commemoration of the birth of Abraham Lincoln and Charles Darwin. The degree of Doctor of Science was conferred upon Mr. Acheson because of the many successes he has scored as results of his scientific research. It was Mr. Acheson who gave to the world the abrasive known as Carborundum, also the product Siloxicon, as well as Artificial Graphite.

His electric furnace work has given him prominence as the greatest electric furnace expert in the world. His work has added very materially to the world's wealth and will be of material assistance in the future conservation of our natural resources, particularly so in the case of lubricating oils, as his latest process for deflocculating graphite and applying it to lubrication is esteemed and appreciated as a factor destined to largely conserve the world's supply of lubricants.

Henry R. Towne, president of the Yale & Towne Manufacturing Company, New York and Stamford, Conn., was recently elected president of the Merchants' Association of New York by a unanimous vote of the Board of Directors.

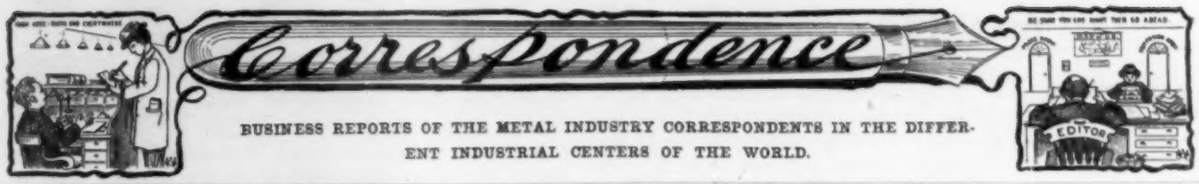
Hugo Vits, of Manitowoc, Wis., has been appointed purchasing agent for the Aluminum Goods Manufacturing Company, which was recently organized in New York by a combination of three of the largest aluminum concerns of the country, including the plants here and at Two Rivers. Mr. Vits' headquarters will be in Manitowoc for the present, but he may later be transferred to New York or Chicago, the principal offices of the company being in New York.

Mrs. F. A. Woolsey McIntosh, who has been a publicity manager for a number of large manufacturing concerns, is now located at 539 Real Estate Trust Building, Broad and Chestnut streets, Philadelphia, Pa., where she is looking after the interests of a client.

William H. Goldstine, superintendent of the foundry of the Norwalk Brass Company in Mechanic street, Norwalk, Conn., has resigned his position to take another as superintendent of the aluminum and bronze foundries of the Buick Motor Company, at Flint, Michigan. The concern employs about 4,000 people and expects to greatly enlarge its plant.

Hugh McPhee, who has just completed the installation of a brass foundry for the Buick Motor Company, Flint, Mich., has accepted a position as superintendent with the Edna Smelting and Refining Company, of Cincinnati, Ohio.

George Thompson, who until recently was with the Kennedy Valve Company, at Elmira, N. Y., has now joined the forces of the Chapman Valve Company, at Indian Orchard, Mass.



BUSINESS REPORTS OF THE METAL INDUSTRY CORRESPONDENTS IN THE DIFFERENT INDUSTRIAL CENTERS OF THE WORLD.

WATERBURY, CONN.

April 7, 1909.

Last month your correspondent reported indications of a sure and steady improvement, and this month there is every evidence of this in practically all the metal factories in this vicinity. There are more employed, orders are increasing, and it will not be surprising if nearly every plant in the Naugatuck valley is running full time with full payroll before May 1.

One of the surest indications of the increase in business is the rush which has been marked in the freight yards of the city since the middle of March. There has been no let-up in the volume of goods to be shipped since this near-boom struck, and there is little indication that the tide will be soon turned backward. Manufacturers here view this condition with much satisfaction, as it bears out their prophecies of an early return of business after election on account of the shortage of stock such as is manufactured here in Waterbury. Unless there is radical adverse tariff legislation, the condition is expected to prevail for some time.

During the past few days there has been considerable discussion in the offices of the city over the organization of the International Smelting & Refining Company, in whose list of directors, as announced a few days ago, appeared the name of Charles F. Brooker, president of the American Brass Co. It is considered significant that Mr. Brooker is one of the directors, in view of the part he played in the movement among brass manufacturers to beat down the price of copper when it was soaring around twenty-five cents a pound, in the fall of 1907. It was well known at that time that the abuse of its monopoly by the United Metals Selling Company, which then controlled the output of the mines as far as the buyer of copper for manufacturing was concerned, was resented by brass makers in all parts of the country, and that Mr. Brooker, head of the largest buyer of copper in the country, at that time, the American Brass Company, was one of the most active in breaking the market. With his connection with the new smelting company, furnishing opportunities for buying which were probably never before available to the American Brass Company interests, it is expected that the corporation he now is executive of will be able to produce brass for the market at reasonabe enough rates to insure a prosperous business and ready demand for years to come. The International Smelting and Refining Company is said to have acquired control of the Raritan Refining Co., formerly owned by the United Metals Selling Company.

Throughout the valley the small factories are enjoying the increased prosperity and rapidly regaining their hold on firmer ground in the financial world. Easy money rates during the past few months have contributed largely to this, but if the present rate of business is maintained until the summer season, the majority of companies have excellent hopes for serene financial conditions. Some of the real infant industries hereabouts have learned valuable lessons in economy since the fall of 1907.

Overtime continues in the pin shops, and these are working with nearly full day forces. In novelty manufacturing and in the production of household utensils and miscellaneous brass products there is a steady business caused by holiday orders for fall stock. All the big factories are running on regular time in practically all departments, and overtime in some instances. The plants of the American Brass Company continue to increase their speed and output, although the last to feel the new advance, superficially at least. The Chase Rolling Mill Company, Waterbury Manufacturing Company and the Plume & Atwood Manufacturing Company are working under new stimulus.

In the New England Watch Company's plant scores of new hands are at work, having been hired since the middle of March. This company added a quarter of a million to its capital since the first of the year, and after a slump which caused great worry among the department heads and depleted forces of employes to the minimum number, there is cheerful activity.

All the plants of the International Silver Company here are busy, and in a statement issued April 4, President George H. Wilcox, of Meriden, declared that the company's business during March was the best in its history. The entire system is running full time in all but a few departments.

Orders from the trade are reported to be coming in well, and collections are notably easier than at the beginning of the year. F. B. F.

PROVIDENCE, R. I.

April 7, 1909.

The manufacturing jewelers report considerable irregularity in trade at the present time. This season is naturally a dull one in jewelry circles, and not much business is expected. Some firms report a good strong trade, however, but others announce that their orders have not kept up so well as in former years.

During the ten years ending with 1906, the number of deaths of employes of jewelry establishments in Rhode Island was 557, from all causes. Of this number, 173, or 31.1 per cent., were from tuberculosis, and 51, or 9.2 per cent., from other respiratory causes. This means that 224 deaths out of the entire total were from diseases of the lungs and air passages. These figures are believed to have great significance as showing the excessive number of deaths from diseases of the breathing organs among employes in dust-producing establishments, as compared with the agriculturists, who live in a practically dustless atmosphere.

The tariff committee of the New England Manufacturing Jewelers' and Silversmiths' Association has kept a watchful eye on the tariff bill now pending in Congress. The committee has decided to make an endeavor to have a clause more satisfactory to the jewelry interests incorporated in the schedule. The action desired was outlined at a meeting recently held by the committee, which consists of Henry G. Thresher, Harry Cutler, William A. Copeland, Theodore W. Foster, Providence; Edward A. Sweeney, S. M. Einstein, Attleboro; Charles T. Paye, North Attleboro. What the jewelry interests want is a definite classification of what jewelry really is, to do away with the legal quibbling and disputes that have arisen under the old schedule. They presented to the ways and means committee a schedule which they believe would carry out this purpose, and they are disappointed that it was not made part of the new bill.

Benjamin Thurston, general superintendent of the American Screw Company, was presented at a recent banquet of the heads of departments with a handsome album containing the photographs of all the foremen who have worked under him during the past ten years. The following officers of the Foremen's Association were elected: President, E. H. Disley; secretary-treasurer, G. L. Kelly; executive committee, A. S. Rydin, R. S. Bush, B. R. Waldron, W. R. Logan and James Green.

The following officers were recently elected at the annual meeting of the Rhode Island branch of the National Metal Trades Association: President, E. A. Beaman; vice-president, Henry D. Sharpe; secretary, J. A. Holland; treasurer, John G. Aldrich; executive committee, L. W. Downes, C. E. Davis, H. L. Scott, E. C. Bliss, and the officers. E. S. U.

CLEVELAND, OHIO

April 5, 1909.

Webb C. Ball, the big manufacturing jeweler who has a plant on Superior avenue, N. W., is considering plans for the raising of the Kingmore building, which he owns and which is located on Upper Euclid avenue, near E. 12th street. He intends to put on four additional stories, seven in all, and move his entire plant to the new building when it is remodeled. The new structure will be of glazed terra cotta and in keeping with the fine neighborhood. Mr. Ball is an extensive maker of railroad watches and also maintains one of the best retail jewelry stores in the city.

During the latter part of March the Central Electric Railway Association convened in Cleveland for one day. A special car from Louisville, Ky., brought a party of 60 from the southern part of the State. This special, "The Dixie Flyer," made the longest interurban trip on record. On the return from Cleveland the special went by way of Mansfield, O., where the entire party disembarked and made an extensive inspection of the plant of the Ohio Brass Company, which is one of the largest of its kind in the State.

F. E. Freeman, formerly a jeweler of North Baltimore, O., who is said to have skipped out after having obtained about $700 worth of goods from Bowler & Burdick, manufacturing jewelers of Cleveland, was arrested in Seattle, Washington, a few weeks ago and brought back to Cleveland after a chase of over thousands of miles by detectives of the Cleveland Retail Credit Men's Association. Upon being arraigned Freeman was given a three-year sentence, but was paroled upon the plea of his wife and eight-months'-old baby.

Members of the Sheet Metal Contractors' Association are sending their apprentices to the new Technical High School to develop them into expert metal workers. It is part of a course which the firms here demand of apprentices. Twenty-four apprentices have been entered and the number is to be increased to fifty. Parents are required to sign contracts for the boys covering a period of four years. During the first year the boys receive $5 per week. This is gradually increased until the wages for the second half of the fourth year are $9 a week.

The Cleveland Metal Trades Council has entered upon a campaign for a closer organization among the workers who are now unorganized. The new branch will be known as the Federal Union of Metal Workers. This will embrace workers from a number of the brass shops about the city.

Railroad companies and the police have united in a fight against brass thieves. Within the past month $2,000 worth of brass has been stolen and a number of men arrested.

A large concern in Massachusetts is said to be considering the establishment of a large plant in Lorain, just west of Cleveland. It manufactures brass goods and is said to be one of the largest of its kind in the country.

To better conditions in the shops and to suppress tuberculosis among metal workers and others a number of speakers representing the Anti-Tuberculosis Association have been given noonday addresses recently in which they tell how to avoid the dreaded "white plague."

Fred Lied, a manufacturing jeweler and alderman of Columbus, O., who was convicted of accepting a bribe and who was sent to the penitentiary for four years, was so fat that he had to have a valet. He is 320 pounds in weight and has but one leg. He will be assigned to clerical work. He is unable to dress himself.

L. H. Brunner, sixty-two, one of the best known manufacturing jewelers in Cleveland, died on April 2 of pneumonia. He was for many years a member of the firm of Brunner Bros. He recently resigned on account of ill health. He was a thirty-second degree Mason.—S. L. M.

ERIE, PA.

April 5, 1909.

Business is picking up here somewhat and many of the shops are planning for an increase in the near future. Among those making important alterations and additions are the following:

The American Sterilizer Company, who do a large business in high class steam pressure sterilizers and disinfectors, find it necessary to increase their capacity and have bought about two acres of ground on West 12th street and already have plans about completed for their first building, which they hope to have ready by the last of June.

The Hays Manufacturing Company, located across the street from the new building of the sterilizer company, already have the framework up for a large addition to their foundry and finishing departments. This addition will make their entire plant reach from 12th and Liberty to 12th and Plum streets, an entire block.

The Erie Stamping and Manufacturing Company have also just increased their capacity. They have a brass foundry, finishing and plating departments.

These firms are all located on West 12th street, the growing business district of the city.

The Metric Metal Company, at the other end of town, have about completed the making over of their works into buildings of concrete construction, making a very fine plant. They have a large brass foundry and finishing department.—H. B. N.

BUFFALO, N. Y.

April 5, 1909.

Business in the metal trades was comparatively quiet here last month, but with the arrival of spring dealers profess to see signs of an improvement in nearly all branches, and both the local and out-of-town trade is picking up, though rather slowly. February and March are usually poor months with the shops here.

The trade is affected by a walkout of 200 journeymen plumbers and helpers. The strike was begun on April 1, and is likely to be a long drawn out fight, because the Master Plumbers' Association has taken a determined stand against the demands of the men. The latter ask for an advance in wages of 50 cents a day and the adoption by the bosses of twelve obnoxious shop rules. The journeymen now receive $3.50 for an eight-hour day.

The strike comes at a time when there is not much activity in big buildings except in dwellings, and affects the supply business in brass and plating lines. The supply firms have had a fairly good winter, and the W. A. Case & Son and the Plumbers and Steamfitters' Supply Company report an improvement over a year ago that is quite marked.

Fries & Co., brass founders, have just equipped its Main street plant with Warner & Swasy lathes, and the Aero-chuck made by the Manufacturers' Equipment Company of Chicago. This firm has had a fair business the past winter. March was a slow month with them, but improvement is expected as the warm weather sets in.

The repair work in the city is not of much volume, but the out-of-town contracts are coming in faster than at any time in a year. There is a fairly active demand for castings, rails and special brass work with the local shops. The outlook with regard to work on the boats that will soon begin navigation is not the most cheerful for the trade. Last season was dull, and the shops were not called upon to furnish the usual supply of boiler and engine trimmings.

The A. G. Fries Plating Company and the Monarch Hardware Company, which have been located on Main street since the fire, will on May 1 move to a new location at 200 Terrace, where they will have increased facilities for handling job plating and electro galvanizing. The entire ground floor will be occupied, and much new machinery installed. The Lyman Manufacturing Company has also moved from its downtown location at Terrace and Erie street, to Elmwood avenue, near the railroad.

The International Nut Company, of Niagara Falls, was thrown into bankruptcy by creditors, who are clamoring for their money. The liabilities are in excess of $8,000, and the Detroit Copper & Brass Rolling Mills of Detroit, Mich., is one of the petitioning creditors. Its claim amounts to $103.39.—F. M. A.

TRADE NEWS

TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

The Nelson Valve Company, at Chestnut Hill, Pa., is making extensive additions to their plant.

The Federal Brass Foundry Company, of 319 Hydraulic avenue, South Bend, Md., are now open for business. They solicit orders for all kinds of brass and bronze castings and guarantee their product.

The Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., have so much casting to do in the manufacture of automobiles that they are planning to establish a brass foundry of their own and have already taken the preliminary steps.

The Wetherill Finished Casting Compay, of Philadelphia, Pa., report that they have all of the business they can do, and expect before long to increase their capacity. They are now manufacturing finished castings in Parson's white brass and aluminum.

The new firm of J. F. Wander & Sons, Westbrook, Conn., manufacturers of art novelties in bronze and silver, make a specialty of photo-frames, comb ornaments, belts, buckles, etc., from an entirely new material that they make themselves, and for which they have applied for a patent.

Eberman-Bailey Brass Works Company, Jamestown, N. Y. Herman J. Eberman and James A. Bailey, formerly connected with the designing department of the Art Metal Construction Company, have resigned and formed the above named concern. They will start to erect a brass foundry at once on Institute and Harrison streets, Jamestown.

The Pfau Manufacturing Company, of Cincinnati, is getting ready to move into their new foundry, and have ordered four Fisher furnaces for the melting of brass. These furnaces will soon be ready to ship from the shops in Chicago. These shops are busy turning out brass furnaces that are being sent to all parts of the country.

H. M. Shimer & Co., 19th street and Washington avenue, Philadelphia, Pa., manufacturers of the "Golden Rod" brand of spelter and brazing solder, have recently had a number of tests made of their spelter which showed the following analysis: Zinc, 99.952; cadmium, .037; iron, .008. Consumers of a high grade spelter are successfully using the "Golden Rod" brand.

The process of dry galvanizing seems to be attracting more or less attention and a firm that furnishes the zinc dust suitable for use in this process is A. Klipstein & Co., 122 Pearl street, New York City. This firm also sells caustic potash, high and low grades, sal ammoniac for galvanizing and soldering, prussiate of soda and potash and barium chloride. They solicit inquiries on the products mentioned above.

Yahnig & Cohoon are operating a brass foundry at 77 North street, Bristol, Conn., formerly occupied by the Goodenough Brass Foundry. Yahnig & Cohoon make a specialty of bronze, brass, composition and aluminum castings of all kinds, as well as all grades of babbitt metals. Messrs. Yahnig & Cohoon would like to correspond with firms near New Haven or New York who can supply them with small lots of copper, scrap brass, tin and aluminum.

The Eaton, Cole & Burnham Company, of Bridgeport, Conn., manufacturers of brass goods and gas fittings, has applied to the Fairfield County Superior Court for authority to change its name to the Crane Valve Company. The company, which is one of the large metal-goods concerns of the city, was absorbed several years ago by the Crane Company, of Chicago, and the proposed change of name is intended better to identify the control of the local concern.

The Henry W. Legel Brass Works of Kansas City, Missouri, state that their new factory recently started will not only produce all kinds of brass, bronze and aluminum castings, but also a full line of plumbers' supply outfits. Mr. Henry W. Legel, the proprietor, was superintendent for nine years of the Crampton-Farley Brass Company, of Kansas City, manufacturers of plumbers' brass goods, and is therefore an expert in this line.

The Jonathan Bartley Crucible Company, Trenton, N. J., reports business as being fully up to their expectations, numerous "repeat" orders being received almost daily from concerns that have already tried out the new Bartley pots. The company will have an attractive exhibit at the Foundrymen's convention at Cincinnati. They will also issue very shortly a new catalogue which, it is promised, will be the most valuable ever published by a crucible manufacturer.

A new company for the manufacturing, importing and exporting of nickel platers' supplies and polishing materials has just been incorporated. The capital is $300,000 and the officers are: President, G. W. Levett; vice-president, Chas. M. Levitt; treasurer, Frank M. Levett, and secretary, H. S. Wyckoff. The Levitts mentioned above are the sons of Alexander Levitt, founder and many years president of Zucker & Levitt Chemical Company and of the Zucker, Levitt & Loeb Company.

The Turner Machine Company, of Philadelphia, Pa., has received many duplicate orders for their automatic cock grinder, which has not only been shipped to many firms in the United States, but in various foreign lands as far as Australia. Among the recent duplicate orders have been a machine each for the following firms; J. J. Ryan & Co., Chicago, Ill.; the Kitchen Heat & Light Company, Philadelphia, Pa., and the Central Brass Manufacturing Company, Cleveland, Ohio. The machine is very highly regarded by all who have used it.

It is reported by the daily press that the Buffalo Copper and Brass Rolling Mill Company, Buffalo, N. Y., is about to expand, and will build a big addition to its present large plant at Military Road and Arizona street. The addition will be 178 feet by 144 feet ground dimensions, and will be of structural steel construction, with corrugated steel roof. The contract for the 175 tons of structural steel to go into the construction of the building has just been let to the Buffalo Structural Steel Company. Work will be begun at once on the new building.

The American Manganese Bronze Co. announce that on and after April 12 their main office will be located at their works, Holmesburg, Philadelphia, where all correspondence should be addressed. The company will still retain their office at 99 John street as a sales office, it being the intention of the treasurer, W. A. Locke, to be in New York on Thursday of each week. Besides castings in manganese bronze and other metals the American Manganese Bronze Company makes the celebrated Caskey Valve, which is used for a variety of purposes and for pressures up to 10,000 pounds per square inch.

By the time this paper goes to press the Bennett & O'Connell Company, of Chicago, will have moved into their new business house, which is nearly across the street from their present offices. The building, 94 and 96 South Clinton street, is about finished and ready for occupancy. The whole building will be occupied by them, four stories and basement, each 88 x 52 feet. It is only a few steps south of Madison street, and does not adjoin any other building, having fine light from all sides. The business of this firm has grown to large proportions, which is indicated from the fact that they need a building of this size.

The Ajax Metal Company, Philadelphia, Pa., report that during the business depression they have put their foundry in such a shape that they can increase their output 25 per cent. At the present time they are fairly busy. The company has recently secured a reissue of their original patent for copper-tin-lead bearings and bearing metal containing more than 20 per cent. of lead and has notified all firms manufacturing or intending to manufacture an alloy of this mixture that they are infringers. The patent was reissued Nov. 17, 1908, No. 12,880, original application No. 655,402, August 7, 1900. Title alloy.

The Duplex Metals Company, manufacturers of compound metals, with works at Chester, Pa., are planning to move their headquarters from 208 Fifth avenue, New York City, to Room 305, Pennsylvania Building, Philadelphia, Pa. The New York office will probably be maintained. The Duplex Company are specialists in manufacturing copper clad wire and sheet. Copper and steel are first welded together and then rolled and drawn down to various gauges. Heretofore the sheet rolled has been only six inches wide. The company are now planning to roll copper clad sheet with a width of 72 inches. The officers of the company are Frank R. Chambers, Sr., president; Frank R. Chambers, Jr., vice-president and treasurer; James F. Kinder, secretary. Mr. Page and Mr. Kyle are at the Philadelphia office.

ELECTION.

The annual election of the New York Metal Exchange resulted in the return to office of the official ticket, as follows: President, P. R. Jennings; vice-president, Morton B. Smith; treasurer, Robert L. Crooke; members of the board of managers, B. Hochschild, H. W. Hendricks, L. Vogelstein, G. E. Behr, Paul Koning, George W. Jacques, Emil Baerwald and A. B. Hall, and for arbitration committee, J. Langcloth, E. A. Caswell, E. J. Keane, Edwin Groves and H. D. Bond.

FINANCIAL.

The report of the National Lead Company of New York shows net earnings of $2,902,752, which were $39,492 less than in 1907. The regular quarterly dividends of 7 and 5 per cent., respectively, were paid on the preferred and common stocks, and $164,250 was added to surplus, which at the close of the year was $4,458,455.

Commenting on trade conditions, President Cole says:

"The volume of business done suffered a shrinkage in the aggregate of but 2 per cent. in comparison with the year 1907, which was the largest in our history.

"Business for the current year exceeds that of last, but this was to be expected. It halts in some features, and we do not look for confident trade until all doubt as to the future tariff is dispelled. Competition is increasing, but our position will be maintained by such conservative activity as may be necessary to protect trade."

The stockholders of the Benedict Manufacturing Company met March 23 at its office in East Syracuse. The regular annual dividend of 7 per cent. on both preferred and common stock was declared, and the following officers and directors elected: H. L. Benedict, president; George N. Crouse, first vice-president; C. C. Graham, second vice-president; Charles Van Wagner, secretary: John Bailey, assistant secretary; R. B. Roantree, treasurer; Newton Owen, assistant treasurer; directors, George N. Crouse, Charles Van Wagner and H. L. Benedict. The company's prospects, from the present indications, look exceedingly rosy for 1909. A larger force of men is employed at the present time than ever before. Several departments have been working nights for the last month. The company has recently purchased the patents controlling the United States output of the natural rose hatpins, which have been such a fad for the last few months. These are being turned out at the rate of over 2,000 a day. Notwithstanding this, the orders are coming in faster than the output.

BUSINESS TROUBLES

Schedules in bankruptcy of the H. & H. Manufacturing Company, brass, copper and nickelware, at 554 West Twenty-fifth street, New York city, show liabilities of $121,000 and nominal assets of $52,157, consisting of stock sold by the receiver for $25,900; machinery and plant sold by the receiver for $12,040 covered by chattel mortgage to certain creditors; accounts which have been assigned, $13,000; gas rebate, $500; insurance rebate $700, and cash on hand, $17. Among the creditors are the New York County National Bank, $13,900, secured; Bank of Long Island, at Long Island City, $6,176; Night and Day Bank, $3,372; Northern Bank of New York, $2,602; U. T. Hungerford Brass and Copper Company, $5,189; Bruce & Cook, $3,494, and Herman J. Katz, $20,188.

REMOVALS

The Royal Plating Works, formerly located at 231 Jackson Boulevard, Chicago, Ill., have moved to 101 E. Kinzie street.

The Forest City Plating Works, formerly located at 1648 Fall street, Cleveland, Ohio, have moved to 2108 Superior Viaduct.

McCambridge & Co., Limited, manufacturers of plumbers' supplies, formerly located at 523 Cherry street, Philadelphia, Pa., have moved to 315 N. 20th street.

INCORPORATIONS

Business organizations incorporated recently. In addressing them it is advisable to include also the names of the incorporators and their residence.

JOHN FRICK COMPANY, Manhattan; manufacturing watches and jewelry, etc. Capital, $60,000. Incorporators: J. Frick, A. J. Chatillon, New York, A. W. Knierim, Brooklyn.

FOX MANUFACTURING COMPANY, Chicago, Ill.; to manufacture and deal in jewelers' supplies. Capital, $30,000. Incorporators: C. Joseph Fox, Jacob Fox and Leo Koutz, all of Chicago.

TAYLOR AND COMPANY, INC., Newark, N. J.; to manufacture jewelry. Capital, $100,000. Incorporators: John N. Taylor, Archibald Rutherford and George P. Wright, all of Newark.

CHICAGO METAL SUPPLY COMPANY, Chicago, Ill.; to manufacture and deal in metal castings. Capital, $10,000. Incorporators: E. F. Parry, L. L. Sorup and A. D. Mackey, all of Chicago.

MINNETONKA DIAMOND CO., New York; to manufacture gold and silversmith jewelry, etc. Capital, $75,000. Incorporators: H. W. Allers, Jr., Ellen Hunter and Dennis M. Merry, all of New York.

R. AND J. SPECIALTY COMPANY, New York; to manufacture articles of wood, metal and paper. Capital, $5,000. Incorporators: Morris Rubens, Charles F. Jones and Ralph J. Sachers, all of New York.

CHARLES E. RING IRON AND STEEL COMPANY, Brooklyn, N. Y.; to deal in iron, steel and other metals. Capital, $150,000. Incorporators: Charles F. Ring, William O. Fitch and Sidney L. Taylor, all of Brooklyn.

MESSINGER AND PARKS' MANUFACTURING COMPANY, Aurora, Ill.; to manufacture and deal in sheet metal goods. Capital, $25,000. Incorporators: Frank C. Messinger, Vernon H. Parks and John P. Smith, all of Aurora.

HYGIENE METAL CABINET AND MANUFACTURING COMPANY, Evansville, Ind.; to manufacture cabinets, etc., of metal. Capital, $20,000. Incorporators: Chas. F. Shroeder, John H. Shroeder and Claude A. Ellis, all of Evansville.

METAL PACKAGE COMPANY, Brooklyn, N. Y.; to manufacture and deal in brass, copper, bronze, tin, zinc, aluminum, etc. Capital, $100,000. Incorporators: A. E. Bruning, H. F. Rueger, V. Bruning and F. Bruning, all of Brooklyn.

FALL RIVER FOUNDRY AND MACHINE COMPANY, Fall River, Mass.; general foundry and machine shop. Capital, $10,000. President, Thomas H. McNerney; treasurer, Thomas T. Daley; clerk, James P. McNerney, all of Fall River.

THE CLEVELAND PLATING COMPANY, Cleveland, Ohio; general

plating business. Capital, $10,000. Incorporators: Thomas P. Howell, Fred W. Hempy, Oren M. Worthington, George C. Wing and Frank H. Hempy, all of Cleveland.

THE CHASE CORPORATION, Waterbury, Conn.; capital, $5,000,000; begin business with $15,000; to manufacture and deal in brass, copper and other metallic goods, and in other kinds of real and personal property. Incorporators: H. S. Chase, Irving H. Chase and Fred. S. Chase, all of Waterbury. This is a holding company for the various Chase manufacturing concerns in Waterbury.

NEW ALUMINUM CORPORATION.

In the January number of THE METAL INDUSTRY we mentioned the report of the combination of the aluminum goods manufacturers of the United States, but the various companies interested at that time would neither deny or affirm the report. Recently articles of incorporation have been filed in the State of New Jersey of the Aluminum Goods Manufacturing Company, with headquarters at Newark, N. J., to manufacture wares made of aluminum. The capital is $750,000, and the incorporators are Joseph Koenig, Two Rivers, Wis.; George Vits, Manitowoc, Wis.; Gustav A. Kruttschnitt, Newark, N. J. Officers: G. A. Kruttschnitt, president; Joseph Koenig and George Vits, vice-presidents, and James C. Coleman, secretary and treasurer. It is stated the combination includes the Manitowoc Aluminum Novelty Company, of Manitowoc, Wis.; the Aluminum Manufacturing Company, Two Rivers, Wis., and the New Jersey Aluminum Company, Newark, N. J. These companies are three of the largest aluminum goods manufacturers in the United States and are half the number of the concerns engaged in the manufacture of aluminum goods. The firms not in the corporation are the Illinois Pure Aluminum Company, Lemont, Ill.; Buckeye Aluminum Company, Doylestown, Ohio, and the Aluminum Cooking Utensil Company, Pittsburg, Pa. The last concern is a subsidiary corporation of the Aluminum Company of America, of Pittsburg, Pa., producers of metallic aluminum in all forms.

PRINTED MATTER

G. W. FLEMING, of Bradford, Pennsylvania, tell about the Horth ball cock in a small leaflet. This ball cock has a positive action, cannot leak, closes with the pressure in the pipe and opens by means of a jack screw.

THE E. H. MUMFORD COMPANY, Philadelphia Pennsylvania, give a comprehensive view and description of their new 10-inch high-tension squeezer in a new folder, and which machine, they say, is the least expensive power molding machine sold.

I. SHONBERG, Brooklyn, New York, has issued a circular giving a report of transverse and compression tests of their M. M. grade [S] bearing metal. These tests are very interesting and bear out the claims made for the metal by the manufacturer.

SILVERWARE. The R. Wallace & Son Manufacturing Company, silversmiths, Wallingford, Conn., have issued for March their miniature magazine, called *The Wallace*. This is an interesting little booklet relating to the dainty and exclusive patterns of silver-plated ware manufactured by this concern.

FOOT PRESSES of all kinds and descriptions are illustrated in a 24-page circular issued by The Manville Brothers Company, of Waterbury, Connecticut. This company also make automatic four-slide cone forming machines, power presses, pin machinery and any kind of high-grade special machinery built to order.

THE OBERMAYER BULLETIN OF FOUNDRY INFORMATION, the house organ of the S. Obermayer Company, of Cincinnati, manufacturers of everything for the foundry, is out for March. This bright and entertaining journal contains a fund of information regarding puzzling questions of foundry practice. It may be had for the asking.

MULTIVANE FAN. "Our New Product" is the term used for Bulletin No. 158 of 16 pages recently issued by the B. F. Sturtevant Company, Hyde Park, Mass. This pamphlet gives a detailed description and illustrations of the steam, turbine and electric propeller fans, high pressure blowers and exhausters manufactured by this company.

FERRACUTE MACHINE COMPANY, Bridgeton, New Jersey, have a new temporary catalogue desciptive of all kinds of presses, including cutting, notching, wiring and horning, drawing and redrawing, embossing and punching presses. This firm also make a full line of sheet metal tools and dies, prices of which they will be pleased to quote on application.

RICHARDS & COMPANY, BOSTON, MASS., issue two booklets describing Parson's white brass for bearings and Parson's manganese bronze. These books are filled with interesting data concerning these two important alloys. The book on manganese bronze in particular contains photographs of articles made of this metal, together with results of tests of all kinds and instructions for its use.

ROTARY ANNEALING AND HARDENING FURNACE—The W. S. Rockwell Company, whose offices are in the Hudson Terminal Building, 50 Church street, New York, have issued pamphlet No. 2, relating to this furnace, which is suitable for handling in quantities brass, copper, steel, iron, aluminum, gold, silver and other metals. A similar furnace externally fired was described in the November, 1906, number of THE METAL INDUSTRY.

THE NORTON COMPANY, of Worcester, Massachusetts, have produced a work of art in their new catalogue of grinding wheels and machinery. The cover is of heavy cardboard the color of alundum, their special abrasive. It is embossed with a representation of a Norten wheel. Inside the book is filled with handsome illustrations on heavy glazed paper. The book also contains descriptions and tables of all of the different forms of grinding materials made by the company.

CHRISTOPHER COLUMBUS. A clever satire on "Christopher Columbus" has been written by F. W. Haskell, president of The Carborundum Company, Niagara Falls, N. Y. The pamphlet is timely, inasmuch as the Legislature of the State of New York has passed a law making October 12 (the birthday of Columbus) a legal holiday. Anyone who has become rusty on Christopher's biography should read Author Haskell's sketch, which is entitled "Revised American Statesmen Series," volume one.

THE PLATE for March, 1909, being No. 3 of Vol I, has been issued by the Dow Chemical Manufacturing Company of Mansfield, Ohio. This interesting little magazine contains some valuable information on copper plating, electric cleaning process; directions for the use of hydrofluoric acid as a pickling agent, and data relating to the various machines and chemical compounds manufactured and sold by this firm. This journal is sent free to those connected with the purchasing department or operation of plating and polishing of metals.

IT STANDS ANY HEAT is stamped in gold on the embossed cover of the new catalogue issued by The Waterbury Crucible Company, of Waterbury, Conn., manufacturers of superior black lead crucibles. This 20 page pamphlet contains besides illustrations of the factory and products, tables of sizes and dimensions of the numerous varieties of crucibles manufactured here. There are also valuable hints for prolonging the life of a crucible embodied in the article headed Plain Talk and Solid Facts, which is well and entertainingly written. The company are glad to send this catalogue to any one interested in the use of crucibles.

PHOSPHOR BRONZE. The Phosphor Bronze Smelting Company, Limited, 2200 Washington avenue, Philadelphia, Pa., have issued Price List No. 24, which replaces all previous price lists for "Elephant Brand" of phosphor bronze. The Phosphor Bronze Smelting Company are the original and sole American manufacturers of the "Elephant Brand" of phosphor bronze. Price List No. 24 describes all forms of phosphor bronze products and contains valuable tables on sheet, rod and wire. The changes in prices noted in the new list are on 8" turned rods, a new rate on large work, the withdrawal of prices on ordinary rods and a new list for rough cast bushings. Every manufacturer who uses or expects to use phosphor bronze in any form will find Price List No. 24 interesting and instructive.

ADNEWS

The E. W. Bliss Co., Brooklyn, N. Y., are advertising sprue cutters.

The Hanson & Van Winkle Company, Newark, N. J., have taken an extra half-page in which to advertise their new independent spindle polishing and buffing lathe.

The Sandoval Zinc Co. chemical department, East St. Louis, Ill., are emphasizing the importance of their granulated chloride of zinc to brass, copper and aluminum founders. In their advertisement on another page they give particulars and prices.

The Metal Dross Economy Company, Bristol, Conn., calls attention to their patented process for cleaning metal drosses. A full description of this new device was given on page 29 of the January METAL INDUSTRY. A review of the patent is published in this issue.

E. E. Steiner, 60 Union street, Newark, N. J., is advertising the Steiner Sectional Portable Ovens for japanning, enameling, baking, drying and similar purposes, and also drying-out sawdust boxes fitted with gas burners or steam coils. These boxes are made in special sizes to order.

R. J. Taylor, Incorporated, 1900-1916 Callowhill street, Philadelphia, Pa., are firm believers in METAL INDUSTRY advertising, and have just increased their space from a quarter to a half page. The corporation reports that they have never stopped running all through the business depression, and at present are fairly active.

COPPER PRODUCTION

(Issued by the Copper Producers' Association.)

	April 12, 1909. Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, March 1, 1909....	173,284,248
Production of marketable copper in the United States from all domestic and foreign sources during March, 1909	117,058,661
Deliveries of marketable copper for consumption and export during March, 1909.....	108,063,007
Stock of marketable copper of all kinds on hand at all points in the United States, April 1, 1909.....	182,279,902

METAL MARKET REVIEW.

NEW YORK, April 9, 1909.

COPPER.—The price of Standard Copper in London shows a net decline of 5s. for the month. Opening at £57. 5s., prices declined to £54. 12s. 6d., and later advanced to £58. 26s. 6d., and closed at £57. The advance to over £58 was partly engineered by buying orders from this side at a time when consumers in America were inquiring, and certain interests here were manipulating an advance in the domestic market.

A fairly large business was done in Copper during the month of March. After the publication of the Copper Producers' figures consumers seemed to realize that prices were pretty close to rock bottom, and orders were placed for home and foreign account. Lake Copper, after selling down to around 12¾ to possibly 12⅝, prices were pushed up as soon as the buying movement started to 13⅛ cents at the close, and the market to-day is firm but quiet at this price.

The exports for the month were 20,824 tons, making total exports for the first three months of 53,900 tons, against 79,379 tons for the same period during 1908. The European statistics show a decrease of about 1,000 tons since the middle of the month. The figures of the Copper Producers' Association will not be published till the 10th, and it is expected that the deliveries for the month will show a substantial increase over previous two months, and that the stock of marketable Copper on hand April 1 will not show such a heavy increase. Stocks are bound to increase as long as consumption keeps up at present rate, but they are hardly likely to increase at the rate of 30,000,000 pounds a month, as they did in February.

The market closes firm but quiet with Lake 12⅞ to 13⅛, Electrolytic 12.65 to 12.75, Casting brands 12½ to 12⅝ cents.

TIN.—The London Tin market has fluctuated as irregularly during the month as usual, and prices at the close are about £4 per ton higher.

The New York market has been quite active, with the general impression pretty well distributed that prices were going to be higher. There has been a large business done, and consumption for the month is figured at 3,900 tons, against 2,700 a month ago and 3,150 tons during March, 1908. The total visible supply on March 31 shows a decrease of 1,500 tons from the previous month, and the market generally is in a fairly strong statistical position. Spot lots, 5-10 tons, 29.40 to 29.45, futures, 5 to 10 points higher.

LEAD.—The foreign Lead market has ruled very steady at around £13. 3s. 9d. to £13. 13s. 9d. at the close.

The New York market has been firmer, and prices show an advance for the month of about 15 points. The proposed reduction of duty has had no immediate effect on prices, and is not likely to, as we are considerably below the foreign parity. The Lead Trust advanced their price from 4 cents to 4.10, and the market at the close is fairly firm at 4.10, New York carload lots, and at 3.92½ to 3.95 East St. Louis.

SPELTER.—The foreign Spelter market has been dull and easier, with prices about 10s. lower for the month.

The New York market has been dull and featureless; prices have advanced about 7½ points for the month. Business during the month has been poor and disappointing. Carload lots 4.85 New York, and at 4.65 to 4.70 East St. Louis.

ANTIMONY.—The foreign price of Antimony is about £1 higher.

In New York the Antimony market has been dull and weak, and prices are from 5 to 10 points lower, with very little business passing. Cookson's, 7.90; Hallett's, 7.65 to 7.70.

SILVER.—The London Silver market has ruled fairly steady, opening at 23¾d. and closing at 23 3-16d.

In New York the market has been dull and quiet, opening at 50¾ cents, and closing at 50⅜.

QUICKSILVER.—There has been no change in the price of Quicksilver. Wholesale lots, $44.50 per flask, and jobbing lots at $45 to $46.50 per flask.

PLATINUM.—The market is steady at $22.50 to $23.00 for ordinary, and $24.50 to $25.50 for hard.

SHEET METAL.—There has been no change in the price of Sheet. The demand shows a slight improvement, and the outlook is generally brighter.

OLD METALS.—The Old Metal market tried very hard to brace up, with the advance from the low prices of Copper, but business is far short of the normal, and the outlook is not very encouraging.

THE MARCH MOVEMENTS IN METALS.

COPPER.	Highest.	Lowest.	Average.
Lake	13.12½	12.65	13.00
Electrolytic	12.75	12.25	12.60
Casting	12.65	12.15	12.50
TIN	29.55	28.35	28.75
LEAD	4.10	3.95	4.05
SPELTER	4.85	4.75	4.85
ANTIMONY (Hallett's)	8.00	7.90	7.95
SILVER	.50¾	.50⅜	50.46

DAILY METAL PRICES.

We have made arrangements with the New York Metal Exchange by which we can furnish our readers with the Official Daily Metal Market Report of the Exchange and a year's subscription to THE METAL INDUSTRY for the sum of $10. The price of the report alone is $10. Sample copies furnished for the asking. We can furnish daily telegraphic reports of metal prices. Address THE METAL INDUSTRY, 61 Beekman street, New York.

Trade Wants on Advertising Pages 26 to 29 Following

Metal Prices, April 9, 1909.

NEW METALS.

	Price per lb. Cents.
COPPER—PIG, BAR AND INGOT AND OLD COPPER. Duty Free, Manufactured 2½c. per lb.	
Lake, car load lots	13.12½
Electrolytic, car load lots	12.75
Casting, car load lots	13.62½
TIN—Duty Free.	
Straits of Malacca, car load lots	29.45
LEAD—Duty Pigs, Bars and Old, 2⅛c. per lb.; pipe and sheets, 2½c. per lb.	
Pig lead, car load lots	4.10
SPELTER—Duty 1½c. per lb.	
Western, car load lots	4.85
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods, 13c. per lb.	
Small lots	28.00
100 lb. lots	25.00
Ton lots	24.00
ANTIMONY—Duty ¾c. per lb.	
Cookson's cask lots, nominal	7.90
Hallett's, cask lots	7.70
Other cask lots	7.60
NICKEL—Duty 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.45 to .60
MANGANESE METAL—Duty 20%	.80
MAGNESIUM METAL—Duty free	1.30
BISMUTH—Duty free	1.80
CADMIUM—Duty free	1.00
	Price per oz.
GOLD—Duty free	$20.67
SILVER—Duty free	.50⅜
PLATINUM—Duty free	23.50
QUICKSILVER—Duty 7c. per lb. Price per pound	.62c. to 63c.

OLD METALS.

	Price per lb. Cents.	
Heavy Cut Copper	11.00	11.50
Copper Wire	11.00	11.50
Light Copper	9.50	10.00
Heavy Mach. Comp.	10.50	10.75
Heavy Brass	8.00	8.50
Light Brass	6.00	6.50
No. 1 Yellow Brass Turnings	7.00	7.50
No. 1 Comp. Turnings	8.00	8.50
Heavy Lead	3.70	3.85
Zinc Scrap	3.00	3.50
Scrap Aluminum, turnings	6.00	7.00
Scrap Aluminum, cast, alloyed	13.00	16.00
Scrap Aluminum, sheet (new)	16.00	18.00
Old Nickel, solid	19.00	23.00
No. 1 Pewter	18.00	19.00

INGOT METALS.

	Price per lb. Cents.
Silicon Copper 10% to 20%....according to quantity	28 to 30
Silicon Copper, 30%, guaranteed " "	30 to 32½
Phosphor Copper, 5% " "	19 to 21
Phosphor Copper, 10% to 15%, guaranteed " "	28 to 30
Manganese Copper, 30% " "	30 to 35
Phosphor Tin " "	34 to 36
Brass Ingot, Yellow " "	9 to 10
Brass Ingot, Red " "	12 to 13
Bronze Ingot " "	11 to 12
Manganese Bronze " "	17 to 19
Phosphor Bronze " "	13 to 16
Casting Aluminum Alloys " "	29 to 35

PHOSPHORUS—Duty 18c. per lb.
According to quantity ..... 32 to 40

PRICES OF SHEET COPPER.

BASE PRICE, 18 Cents per Lb. Net.

PRICES MENTIONED BELOW ARE FOR QUANTITIES OF 100 LBS. AND OVER.

SIZE OF SHEETS.		64 oz. and over 50 lb. sheet 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lbs. sheet 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet 30 x 60.	12 oz. and 13 oz. 9½ to 11 lb. sheet 30 x 60.	10 oz. and 11 oz. 7¾ to 9½ lb. sheet 30 x 60.	8 oz. and 9 oz. 6¼ to 7¾ lb. sheet 30 x 60.	Lighter than 8 oz.
		Cents Per Pound Over Base Price for Soft Copper.								
Not wider than 30 ins.	Not longer than 72 inches.	Base	Base	Base	Base	1	2	3	6	9
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	1	3	6	9	
	Longer than 96 inches.	"	"	"	"	2	6			
Wider than 30 ins. but not wider than 36 inches.	Not longer than 72 inches.	"	"	"	"	2	4	7	10	
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	2	6	9		
	Longer than 96 inches. Not longer than 120 inches.	"	"	"	1	3				
	Longer than 120 inches.	"	"	1	2					
Wider than 36 ins. but not wider than 48 inches.	Not longer than 72 inches.	"	"	1	2	4	7	10		
	Longer than 72 inches. Not longer than 96 inches.	"	"	1	3	5	8			
	Longer than 96 inches. Not longer than 120 inches.	"	"	2	4	8				
	Longer than 120 inches.	"	1	3	6					
Wider than 48 ins. but not wider than 60 inches.	Not longer than 72 inches.	"	Base	1	3	6	11			
	Longer than 72 inches. Not longer than 96 inches.	"	"	2	4	9				
	Longer than 96 inches. Not longer than 120 inches.	"	1	3	6					
	Longer than 120 inches.	1	2	4	8					
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 inches.	Base	1	3	8					
	Longer than 96 inches. Not longer than 120 inches.	"	2	5	10					
	Longer than 120 inches.	1	3	8						
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 inches.	1	3	6						
	Longer than 96 inches. Not longer than 120 inches.	2	4	7						
	Longer than 120 inches.	3	5	9						
Wider than 108 ins.	Not longer than 132 inches.	4	6							
	Longer than 132 inches.	5	8							

The longest dimension in any sheet shall be considered as its length.

CIRCLES, SEGMENTS AND PATTERN SHEETS, advance over prices of Sheet Copper required to cut them from. 3 cents per pound.

COLD OR HARD ROLLED COPPER, 14 oz. per square foot, and heavier, add ..... 1 " " "

COLD OR HARD ROLLED COPPER, lighter than 14 oz., per square foot, add ..... 2 " " "

POLISHED COPPER, 20 INCHES WIDE and under, advance over price for Cold Rolled Copper of corresponding dimensions and thickness ..... 1 " " "

POLISHED COPPER, WIDER THAN 20 INCHES, advance over price for Cold Rolled Copper of corresponding dimensions and thickness ..... 2 " " "

COLD ROLLED COPPER, PREPARED SUITABLE FOR POLISHING, same as Polished Copper of corresponding dimensions and thickness.

COLD ROLLED AND ANNEALED COPPER SHEETS OR CIRCLES, same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

ROUND COPPER ROD, ⅜ inch diameter or over.....**Base Price.**

(Rectangular, Square and Irregular Shapes, Copper Rod, Special Prices.)

ZINC—Duty, sheet, 2c. per lb.	Cents per lb.
Carload lots, at mill	6.75 less 8%
Casks	7.25
Open casks	7.75

Metal Prices, April 9, 1909

PRICES ON BRASS MATERIAL—MILL SHIPMENTS.

In effect Feb. 25, 1909, and until further notice.

To customers who purchase less than 40,000 lbs. per year and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.13½	$0.15½	.17
Wire	.13¾	.15¾	.17½
Rod	.13¾	.15¾	.18⅛
Brazed tubing	.19⅞	—	.22
Open seam tubing	.17⅞	—	.20
Angles and channels, plain	.17⅞	—	.20

30% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass..	½c.	per lb. net advance
" —Best spring, drawing and spinning brass....	1½c.	" " " "
Wire—Extra spring and brazing wire.....	½c.	" " " "
" —Best spring and brazing wire.....	1c.	" " " "

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.14½	$0.16½	$0.18
Wire	.14¾	.16¾	.18½
Rod	.14¾	.16¾	.19⅛
Brazed tubing	.20⅞	—	.23
Open seam tubing	.18⅞	—	.21
Angles and channels, plain	.18⅞	—	.21

5% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass....	½c.	per lb. net advance.
" —Best spring, drawing and spinning brass....	1½c.	" " " "
Wire—Extra spring and brazing wire	½c.	" " " "
" —Best spring and brazing wire.....	1c.	" " " "

BARE COPPER WIRE—CARLOAD LOTS.

14¼c. per lb. base.

SOLDERING COPPERS.

300 lbs. and over in one order	18½c. per lb. base.
100 lbs. to 300 lbs. in one order	19c. " " "
Less than 100 lbs. in one order	20½c. " " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in O. D. Nos. 4 to 13 Stubs' Gauge, 19c. per lb.
Seamless Copper Tubing, 23c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size	¼	⅜	½	⅝	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	27	26	21	20	19	19	19	19	19	19	19	20	21	23	25	26

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 feet Brass.	Bronze.
⅜ inch	$8	$9
½ inch	8	9
⅝ inch	10	11
¾ inch	12	13
⅞ inch	14	15
1 inch	18	20
1¼ inch	22	24
1¼ inch	25	27
1½ inch	32	35
1¾ inch	45	48
2 inch	56	60

Discount 45 and 5%.

PRICES FOR MUNTZ METAL AND TOBIN BRONZE.

Muntz or Yellow Metal Sheathing (14" x 48")	14c. lb. net base
" " " Rectangular sheets other than Sheathing	16c. " " "
" " " Rod	15c. " " "
Tobin Bronze Rod	17c. " " "

Above are for 100 lbs. or more in one order.

PLATERS' METALS.

Platers' bars in the rough 22½c. net.

German silver platers' bars dependent on the percentage of nickel, quantity and general character of the order.

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturers.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quantity.

Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

	Wider than..... and including..... in coils.	3in. 12in.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
No. 13 and heavier		34	34	36	36	36	36	39	39	39
" 14		34	34	36	36	36	36	39	39	39
" 15		34	34	36	36	36	36	39	39	39
" 16		34	34	36	36	36	36	39	39	39
" 17		34	34	36	36	36	36	39	39	39
" 18		34	34	36	36	36	36	39	39	42
" 19		34	34	36	36	36	36	39	40	43
" 20		34	36	36	36	36	38	41	42	44
" 21		34	38	38	38	38	40	43	44	50
" 22		34	38	38	38	40	40	43	47	51
" 23		34	38	38	38	40	40	43	49	52
" 24		34	38	40	42	42	42	45	51	54
" 25		36	39	41	43	43	43	46	53	57
" 26		36	39	42	46	46	46	51	55	61
" 27		36	40	44	48	48	49	54	58	64
" 28		36	40	46	48	40	49	56	62	67
" 29		38	41	48	50	52	52	61	67	72
" 30		38	42	50	52	56	62	69	72	77
" 31		43	47	55	58	63	71	74	77	83
" 32		45	49	57	61	69	77	91	90	95
" 33		47	51	60	65	73	84	91	100	110
" 34		50	55	62	70	78	91	103	110	120
" 35		..	65	70	80	90	100	115	125	..
" 36		..	80	90	100	115	120	135	..	..
" 37		..	104	114	129	144	159	174	..	..
" 38		..	124	139	154	169	184	204	..	..
" 39		..	144	164	184	204	224	..	..	..
" 40		..	174	204	224	244	..	..	..	..

In flat rolled sheets the above prices refer to lengths between 2 and 3 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are 100 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST SEAMLESS ALUMINUM TUBING.

STUBS' GAUGE THE STANDARD. SIZES CARRIED IN STOCK.
Outside Diameters. BASE PRICE, 25 Cents per Pound.

Stubs' Gauge.	Inches.	¼ in.	5-16 in.	⅜ in.	½ in.	⅝ in.	¾ in.	⅞ in.	1 in.	1¼ in.	1½ in.	1¾ in.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.
11.	.120.	..	..	..	..	..	..	..	26	23	..	..	13	11	9	8	15	22
12.	.109.	..	..	..	..	..	..	..	25	..	..	..	14	..	..	..	..	..
14.	.083.	..	..	..	..	..	..	..	..	..	..	..	16	..	..	..	..	..
16.	.065.	..	..	..	..	..	27	26	26	23	22	20	20	20	20	26	30	36
18.	.049.	..	..	..	..	32	29	28	27	24	25	25	25	..	..	..	..	..
20.	.035.	116	..	45	38	33	32	31	29	28	29	29	20	30	37	48	57	80
21.	.032.	..	..	..	39	..	..	..	..	..	..	..	..	..	..	..	..	..
22.	.028.	137	97	47	41	37	36	34	33	..	..	44	..	..	..	..	..	..
24.	.022.	187	132	107	87	78	72	61	59	65	..	..	..	..	..	..	..	..

Prices are for ten or more pounds at one time. For prices on sizes not carried in stock send for Manufacturers' List.

PRICE LIST FOR ALUMINUM ROD AND WIRE.

Diameter. B. & S. G'ge.	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb. ...	32	32½	32½	33	33½	34	34½	35	36	37	38	43	46

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50%.

GERMAN SILVER TUBING.

4 per cent.	to No. 19,	B. & S. Gauge,	inclusive	$0.60
6 "	" 19,	"	"	.70
9 "	" 19,	"	"	.85
12 "	" 19,	"	"	1.00
15 "	" 19,	"	"	1.15
16 "	" 19,	"	"	1.20
18 "	" 19,	"	"	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.

For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 40%.

PRICE OF SHEET SILVER.

Rolled sterling silver .925 fine is sold according to gauge quality and market conditions. No fixed quotations can be given as prices range from 2c. below to 6c. above the price of bullion.

Rolled silver anodes .900 fine are quoted at 2c. above the price of bullion.

METALLIC ALLOYS COMPANY

50 Church Street, New York City

IF it should happen to be a matter of price, quality, or of getting it NOW, no matter what metal or alloy you want

ASK US.

30% MANGANESE COPPER

is an alloy of considerable importance to Brass Foundrymen, whether or not they make Manganese Bronze.

WE ARE

prepared to ship AT ONCE—meaning the same day order is received

Manganese Di-Oxide	Antimony
30% Manganese-Copper	80% Ferro-Manganese
30% Silicon Copper	Outerbridge Silicon Alloy
Aluminum	70% Ferro-Chrome

25/30% Silico-Manganese

BRASS FOUNDERS' SUPPLIES

YOU MAY SAFELY SEND US AN OPEN ORDER

See Next Page for Want Advertisements

TRADE WANTS

AN EXCHANGE FOR THE WANTS OF THE METAL TRADES.
Advertisements will be inserted under this head at 40 cents per line, 3 lines one dollar, for each insertion, excepting Situations Wanted, 20 cents per line, 3 lines half a dollar. Answers sent in our care will be forwarded.

METALS, MACHINERY AND SUPPLIES FOR SALE

FOR SALE
ONE NO. 2
Double Chamber Rockwell Furnace
ALMOST NEW
Address ROCKWELL, care THE METAL INDUSTRY

FOR SALE
Eleven Brass Melting Furnaces, latest type and drop grates; 3 MILLETTS CORE OVENS with seven shelves; several new cupolas for smelters and refiners; a number of jigs for recovering the fine brass from ashes, etc., which escapes from the ordinary washing machine and which cannot be bought on the market; molders' benches, flasks, weights, cranes and other foundry appliances. These supplies are all new and will be sold at your own price. Write at once to.
OTTO BLESCH, Detroit, Mich.

COPPER AND BRASS SCRAP LEAD AND COPPER
WASTE AND BELTING IRON AND MACHINERY
Bought and Sold. Write Particulars
WALSH'S SONS & CO., Newark, N. J.

FOR SALE—An established concern manufacturing POLISHERS' and PLATERS' COMPOSITIONS. Fully equipped plant and doing a large business all over the country. For further particulars address COMPOSITIONS, care THE METAL INDUSTRY.

FOR SALE—A No. 2 DINGS BRASS SEPARATOR. For further particulars address DINGS, care THE METAL INDUSTRY.

FOR SALE—One No. 4 LITTLE GIANT Zucker & Levett & Loeb Plating Dynamo, 8 volts, 250 amperes. Price reasonable; condition, first class. Address GIANT, care THE METAL INDUSTRY.

FOR SALE—1200 pounds .822 x No. 24 B. & S. Plain Brazed Brass Tubing in 16½ ft. lengths. Newly manufactured stock in A1 condition. Address THE SUSQUEHANNA METAL MANUFACTURING COMPANY, SUSQUEHANNA, PA.

PLATING DYNAMOS, also alternating and direct current motors and dynamos at bargain prices, all makes and sizes bought, sold and repaired. Department F. EUGENE L. RICHTER ELECTRIC CO., N. E. Cor. Uber and Columbia avenue, Philadelphia, Pa.

FOR SALE—WOULD A HUSTLING BRASS MANUFACTURING CORPORATION, with finely equipped shop, near New York, standing orders from large buyers, increasing sales, interest you? Best reasons for selling control. About $30,000 required. Buyer handles business and financial end. Goods patented. Widely catalogued. Demand practically unlimited, efficient sales organization. Principals, come see for yourselves. P. O. BOX 458, Newark, N. J.

FOR SALE.—A PHOENIX PLATING DYNAMO, about 6 volts, 1,500 amperes in first class condition. Address, THE WEHLE COMPANY, NEWARK, OHIO.

WANTED.—To correspond with buyers of METALLIC BISMUTH and BISMUTH ORES in quantity. Address Box M-10, care THE METAL INDUSTRY.

METALS, MACHINERY AND SUPPLIES WANTED

WANTED—Phosphor-Bronze and German Silver tubing. Sizes .051 inside, .071 outside up to ½" outside, 17-gauge stock. Orders average 100 pounds per size. Address TUBING, care THE METAL INDUSTRY.

WANTED—A second-hand DYNAMO of 1,000 amperes or upward for duplex copper work. Address DUPLEX, care THE METAL INDUSTRY.

WANTED—A manufacturer of metal goods would like to correspond with manufacturers of PRESSED BRASS STRIPS for ornamental designs. Address PRESSED BRASS, care THE METAL INDUSTRY.

WANTED—An experienced man who is capable of fitting up and installing a METAL REFINERY in a works which intends to put up a plant. Address REFINERY, care THE METAL INDUSTRY.

CASH PAID for bronze Powder Waste, Gas Mantle Dust, Bismuth, Nickel Mercury, Platinum, Osmoiridium and similar metals in any form. JOSEF RADNAI, 36 Fulton street, New York.

OPPORTUNITIES

BRASS FOUNDERS
Practical information bureau, 40 years' experience with trade secrets, from the furnace to the finisher. Work in all known metals, from common brass to the secret process of tempering copper. 40 formulas, worth a thousand dollars.
PREPAID TO ANY ADDRESS ON RECEIPT OF FIVE DOLLARS.
JAMES ALLEN
2552 J Street, : : : SAN DIEGO, CAL.

British New Patents Act
Advertiser is desirous of undertaking the manufacture of American patents in England. Stamped work of all description. Aluminum work a specialty.
WILFRED & CO., Ltd.
BIRMINGHAM, ENGLAND

PLATERS
By enclosing ten cents in stamps we will forward you one of our anode protectors which will save you work and employer money and keep your solution in better condition than formerly. Address,
PLATERS NOVELTY COMPANY
Box 26, Woodhaven, L. I., N. Y.

FOR SALE
Foreign rights of a VALUABLE PLATING APPARATUS. A device which means the saving of thousands of dollars in a year's time to any plating establishment. Scrap nickel all consumed. Terms moderate. Address,
FOREIGN PATENT, care THE METAL INDUSTRY, N. Y.

WANTED—Some good selling specialties for HARDWARE, AUTO or similar trades. N. STAFFORD COMPANY, 67 Fulton street, New York.

J. P. FANNING, machinist, 678-Jefferson avenue, Brooklyn, N. Y.—Maker of Moulds for Casting Solder, Babbitt Metal, Bar Lead, etc. We also manufacture small work. Write for particulars.

WANTED—Copies of THE METAL INDUSTRY for the months of MAY, 1906, NOVEMBER and DECEMBER, 1908. Anyone having the above mentioned copies, kindly advise THE METAL INDUSTRY.

GOOD SALES, GOOD EQUIPMENT, GOOD ASSISTANTS and GOOD POSITIONS may be obtained by the insertion of a METAL INDUSTRY WANT.

WANTED.—ARTISANS and CRAFTSMEN to develop their color sense with "WAGNER'S AUTOMATIC COLOR COMPASS." Fifty beautiful colors in patented device, shows hormonies and graduations. Price $1.25 with lesson. E. F. WAGNER, Studio, 70 Fifth Avenue, New York City.

INQUIRIES.

Inquiry No. 81—We would like to hear from manufacturers of coal and coke furnaces suitable for brass foundry.
Inquiry No. 82—We would like to correspond with manufacturers of wire nail machinery.
Inquiry No. 83—We would like to correspond with firms making a specialty of "sherardizing."
Inquiry No. 84—We would like to correspond with manufacturers of pressed brass strips.
Inquiry No. 85—We would like to hear from manufacturers of metal electric portables and lamps in rough or unfinished state.
Inquiry No. 86—We would like to correspond with manufacturers of electrolytic zinc.
Inquiry No. 87—We would like to correspond with firms who can furnish silicon copper rolled into sheets and drawn into wire.
Inquiry No. 88—We want aluminum sheets of from 18 to 26" gauge.

SITUATIONS OPEN—Executive

WANTED—As a DEMONSTRATOR, a young man with technical training, and a knowledge of OIL MELTING FURNACES. Must have executive ability. Address, EXECUTIVE, care THE METAL INDUSTRY.

TRADE WANTS

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SITUATIONS OPEN—Commercial

WANTED—By a manufacturer of a limited line of high grade SANITARY BRASS GOODS, active SELLING AGENTS who are at present soliciting business from the plumbing trade to handle this line on a commission basis. In replying state territory in which you are operating and the lines which you are offering. Address MANUFACTURER, care THE METAL INDUSTRY.

SITUATIONS OPEN—Founders

WANTED—Up-to-date MOLDER and MIXER in BRASS and ALUMINUM, capable of taking entire charge of foundry running from 10 to 20 tons weekly. Must be first-class molding machine man and preferably one having experience in AUTOMOBILE CASTINGS. Advise fully regarding last two positions, giving names of concerns, how long with each, duties and character of work handled, also salary desired. Address AUTOMOBILE, care THE METAL INDUSTRY.

WANTED—An ARCHITECTURAL METAL WORKING concern needs as SUPERINTENDING FOREMAN a man of intelligence, shop training, familiarity with foundry practice and ability to handle men. Applicant desiring to invest money for an interest in the business preferred. Address ARCHITECTURAL, care THE METAL INDUSTRY.

WANTED—A SUPERINTENDENT for BRASS FOUNDRY and MACHINE SHOP. One who is capable of making a success in a brass foundry and machine shop manufacturing light and heavy castings and car trimmings. Must understand detail work and be a good estimator of blue prints. Good salary and interest in concern for right party. Write giving full particulars, BOX M-3, care THE METAL INDUSTRY.

WANTED.—FOUNDRY FOREMAN wanted to sell our equipment on a liberal commission basis. Address BOX 139, care THE METAL INDUSTRY.

SITUATIONS OPEN—Platers

WANTED—A FOREMAN and MANAGER for a coffee urn factory. Must have executive ability and be able to do brass finishing or coppersmithing. The chance of a lifetime for the right man with a minimum salary of $1,800 a year and a financial interest in the business. Address THE KELLUM COFFEE & MANUFACTURING COMPANY, Kansas City, Mo.

WANTED—FOREMAN for PLATING and BUFFING ROOM. Must be first-class and know how to handle men. Address, stating salary and reference, FIXTURE, care THE METAL INDUSTRY.

WANTED.—First Class SILVER BUFFER for small plated work. Prefer man who can BURNISH. To such a man a steady position is open. Address BOX 206, care THE METAL INDUSTRY.

SITUATIONS WANTED—Commercial

Advertisements under this head will be insterted for 20 cents per line, 3 lines for Half a Dollar.

SITUATION WANTED.—Experienced BRASS factory man is open for engagement. Thorough executive from FOUNDRY to SHIPPING ROOM. Expert Cost Accountant and Purchasing Agent, Advocate of piece work and bonus systems. Can decrease labor cost and increase output. If you can use a man of my qualifications, address EXPERT, care THE METAL INDUSTRY.

SITUATION WANTED.—SALESMAN experienced in both steam and plumbing lines is open for a position. Thorough acquaintance with the trade in all sections except Pacific Coast. Knows the business thoroughly and can sell goods. Address HUSTLER, care THE METAL INDUSTRY.

SITUATIONS WANTED—Executive

SITUATION WANTED—As SUPERINTENDENT with a firm manufacturing BRASS METAL GOODS for ELECTRICAL purposes. Best of references from last employer. Address C. D. G., care THE METAL INDUSTRY.

SITUATIONS WANTED—Founders

SITUATION WANTED—BRASS FOUNDRY FOREMAN desires a position. 19 years experience on jobbing work, well posted on mixing and melting metals and can furnish good reference. Address C. F. T., care THE METAL INDUSTRY.

SITUATION WANTED.—BRASS FOUNDER with 16 years' experience in all kinds of foundry work. Thoroughly familiar with molding machines, oil furnaces and different mixtures. Have been foreman in several shops and can furnish good reference. Address BOX 203, care THE METAL INDUSTRY.

SITUATIONS WANTED—Founders—Continued

SITUATION WANTED.—By a BRASS FOUNDRY FOREMAN who has had a large experience in brass foundry work and can furnish good reference from last employers. Address BOX 204, care THE METAL INDUSTRY.

SITUATION WANTED.—BRASS FOUNDRY FOREMAN or SUPERINTENDENT having had full charge of foundry for 20 years manufacturing car, locomotive, automobile and machinery castings. Can furnish the best of references. Address BOX 183, care THE METAL INDUSTRY.

SITUATION WANTED—By a competent BRASS FOUNDRY FOREMAN. Accustomed to both large and small work. Good references. Has had experience with large firms. Address FOREMAN, care THE METAL INDUSTRY.

SITUATION WANTED—By a METALLURGIST. Can advise by mail. Familiar with NON-FERROUS ALLOYS. Foundry Managers invited to investigate my up-to-date methods. Address T, care THE METAL INDUSTRY.

SITUATION WANTED—By a CHEMIST. Brass Foundries can receive benefit of my experience at low cost. Familiar with all details. Write for further particulars. Address H, care THE METAL INDUSTRY.

SITUATION WANTED—By a first class BRASS MOLDER who has had a large experience in foundries in the vicinity of New York. Would prefer position near New York. Address BOX 196, care THE METAL INDUSTRY.

SITUATION WANTED.—By a CORE MAKER who has had 12 years' experience on all classes of cores, the last three years on CHANDELIER work. Capable of taking charge and can furnish good reference. Address BOX 197, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class CORE MOLDER who has had a large experience in this line. Can furnish reference. Address BOX 198, care THE METAL INDUSTRY.

SITUATION WANTED.—By a BRASS MOLDER who has had 20 years' experience in this line. Can furnish reference. Address BOX 201, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class FALSE CORE MOLDER in French sand. Understands all branches in green sand, also in dry work. Position as FOREMAN desired. Can take charge of men. Address BOX 134, care THE METAL INDUSTRY.

SITUATION WANTED.—FOREMAN MOLDER would like a position. Thoroughly familiar with all classes of work in this line. Address BOX 164, care THE METAL INDUSTRY.

SITUATION WANTED.—Position as FOUNDRY FOREMAN or SUPERINTENDENT in brass. Have had twenty years' experience and can give the best of references. Do my own mixing. Address O-21, care THE METAL INDUSTRY.

SITUATIONS WANTED—Finishers

SITUATION WANTED.—By a first class BRASS WORKER who has had 10 years' experience on bench, speed lathe, brazing and different kinds of jobbing work. Good reference from last employer. Address BOX 200, care THE METAL INDUSTRY.

SITUATION WANTED.—BRASS TURNER who has had a large experience as foreman would like to hear from any firms who are in need of such a man. Can furnish good reference. Address BOX 205, care THE METAL INDUSTRY.

SITUATIONS WANTED—Platers

SITUATION WANTED—ELECTROPLATER, recently in charge of a large hardware concern desires position in the East. Expert on all solutions, broad practical experience, economical and up-to-date methods. Address E. B., care THE METAL INDUSTRY.

SITUATION WANTED—PLATER with 28 years' experience desires a position. Thoroughly familiar with every color and finish, also expert on plating flowers and other non-metallic substances. E. KNIPPEL, 251 E. 52d street, New York.

SITUATION WANTED—PLATER familiar with all colors, also plating on non-conducting surfaces such as glass, lace, wood, plaster, etc. Address H. KEPPLER, 149 Engert avenue, Brooklyn, N. Y.

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SITUATIONS WANTED—Platers—Continued

SITUATION WANTED—PLATER, POLISHER and BUFFER desires position as FOREMAN with a reliable firm, outside of New York City preferred. Thoroughly up-to-date on all solutions and can furnish good reference. Address S. H., care THE METAL INDUSTRY.

SITUATION WANTED—PLATER with 10 years' experience who has a thorough knowledge of all solutions and finishes, also most modern methods of producing work at the lowest cost. Can furnish first-class reference. Salary moderate to begin. Address M. W., care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER with 15 years' experience, thoroughly understanding all solutions, silver deposit, galvano plastic work, etc. Address BOX 169, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER, POLISHER and BUFFER with 15 years' experience. Hustler and can produce good work. Sober, reliable and can furnish the best of reference from my last employer. Would like to locate west of Chicago. Address BOX 150, care THE METAL INDUSTRY.

SITUATION WANTED.—By an all round DEPOSIT EXPERT. Practical man in all its branches. A first class Designer, Engraver, and Etcher, having a fine white paint, one paint for silver and china. Also plate wood, horn and natural flowers and ornamental electrotyping on rubber. Address DEPOSIT EXPERT, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PRACTICAL PLATER. Can plate on all metals and produce all finishes. Experienced in deposition and etching. Twenty years' experience and is thoroughly capable of taking charge. Address ORMOLU, care THE METAL INDUSTRY.

SITUATION WANTED.—By a competent PLATER who thoroughly understands the plating business from beginning to end. Is capable of taking charge and can furnish the best of references. Address BOX 184, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class PLATER who understands every branch of solutions, dips, dynamos, polishing, grinding, cutting down, etc. Has had 20 years' experience with one firm who will give the best of references. Thoroughly familiar with any kind of work; up-to-date and hustler. Address BOX 186, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first-class POLISHER, PLATER and BUFFER; 20 years experience, and now foreman in charge of large shop. Address POLISHER, care THE METAL INDUSTRY.

SITUATION WANTED.—By an experienced PLATER in nickel, copper, brass and silver, also dipping and oxidizing. Thoroughly understands all finishes and can furnish best of references. Address BOX 187, care THE METAL INDUSTRY.

SITUATION WANTED.—A FIRST CLASS PLATER who desires a position as foreman, who has had 22 years' experience in polishing, plating and buffing. Address BOX 188, care THE METAL INDUSTRY.

SITUATION WANTED—By a FOREMAN PLATER who has had a large experience in Electro Nickel, Brass, Copper Plating, Oxidizing, Brass Dipping and Lacquering. Address, C. S., care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER with 12 years' experience on nickel, copper, brass, oxidizing and all the different finishes. Position in Chicago or vicinity preferred. Can furnish best of references. Address BOX 191, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class PLATER thoroughly familiar with oxidizing and refinishing. Has had 18 years' experience and is capable of taking charge. Can furnish the best of references. Address BOX 192, care THE METAL INDUSTRY.

SITUATION WANTED.—By PLATER, second man on brass, nickel, silver, copper. Understands all finishes. Out of town preferred. Address BOX 132, care THE METAL INDUSTRY.

SITUATION WANTED.—As a FOREMAN or ASSISTANT FOREMAN PLATER. Thoroughly familiar with all kinds of plating, oxidizing, etc. Address BOX 171, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER of 16 years' experience, understanding all solutions, including verde antique. Address BOX 172, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER with 12 years' experience, thoroughly understanding all details of the plating trade. Can furnish excellent reference. Address BOX 173, care THE METAL INDUSTRY.

SITUATION WANTED.—A first class PLATER who is at the present time employed but desires to change, would like to hear from firms desiring a man who thoroughly understands the plating, buffing, etc., of all metals. Address BOX 174, care THE METAL INDUSTRY.

SITUATIONS WANTED—Platers—Continued

SITUATION WANTED—By a FOREMAN PLATER with fifteen years' experience as plater and polisher. Can handle with excellent results Gold, Silver, Copper, Nickel, Brass and Bronze Solutions and their different finishes. Can furnish good reference. Address, BOX 158, care THE METAL INDUSTRY.

SITUATION WANTED—First class PLATER and FINISHER who can make all solutions, also do fancy coloring and polishing on silverware and jewelry. Has had nine years' experience on new and old work. Would like steady position. Address BOX 136, care THE METAL INDUSTRY.

SITUATION WANTED.—By a Silver, Nickel, Copper, Brass or Gold Plater who is willing to start at a moderate salary. Can furnish the best of references. Address BOX 185, care THE METAL INDUSTRY.

SITUATION WANTED.—By a First Class PLATER with several years' experience. Can furnish the best of references. Address O-20, care THE METAL INDUSTRY.

SITUATION WANTED.—FOREMAN of polishing, plating and buffing departments who is thoroughly experienced on brass goods, fine mechanical tools and machinery. Twenty years' experience, 7 years of foremanship. Up-to-date, able to handle help to best advantage, to turn out work at low cost, sober, reliable and can furnish the best of reference from my last two employers. Address BOX 193, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER who has had 14 years' experience in the plating trade. Understands all solutions and can furnish the best of reference. Address BOX 179, care THE METAL INDUSTRY.

SITUATION WANTED.—By a plater who thoroughly understands the plating, polishing, oxidizing and enameling on iron and brass. Long experience as foreman of different departments in plating plants. Address BOX 177, care THE METAL INDUSTRY.

SITUATION WANTED.—By a FOREMAN PLATER with 18 years' experience in plating business, 10 years' experience as foreman of plating and buffing departments. Address BOX 156, care THE METAL INDUSTRY.

SITUATION WANTED.—By a FOREMAN PLATER who can handle help to advantage. Can also do polishing and buffing. Nine years' experience, and can furnish best of reference. Address BOX 165, care THE METAL INDUSTRY.

SITUATION WANTED—By a first class PLATER who prefers to work in the States of New York or New Jersey. Good, sober, steady, reliable man and is thoroughly capable of doing polishing and buffing. Address CAPABLE, care THE METAL INDUSTRY.

SITUATION WANTED.—PLATER up-to-date in ALL FINISHES. Six years' experience and can furnish the best of reference. Address BOX 131, care THE METAL INDUSTRY.

SITUATION WANTED.—By FIRST CLASS PLATER AND POLISHER. Has had 16 years' experience and had charge of men for the last 10 years. Can handle any kind of a plant, understands all finishes and can give good reference. Address O-19, care THE METAL INDUSTRY.

SITUATION WANTED.—FOREMAN PLATER desires a position with NOVELTY OR BUCKLE MANUFACTURER. Thoroughly familiar with all solutions and finishes on BRASS, German Silver, Britannia and Soft Metals. Can take charge of help to advantage. Address BOX 145, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER on Gold, Silver, Black Nickel, Brass, Bronze and Tin. Plating Verde Green, Oxidizing. Address O-22, care THE METAL INDUSTRY.

SITUATION WANTED.—By a PLATER thoroughly familiar with Nickel, Silver, Brass, Copper plating and oxidizing. Can furnish the best of reference. Address BOX 140, care THE METAL INDUSTRY.

SITUATION WANTED.—By a FOREMAN PLATER who thoroughly understands polishing and buffing. Large experience on plumbers' supplies, builders' hardware and job shop work. Thoroughly capable of taking charge of plating room. Address BOX 135, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class PLATER, POLISHER and BUFFER. Twenty years' experience in all branches of plating work. Expert in all solutions and finishes, silver deposit, galvano plastic, metallizing non-metallic subjects, cold galvanizing, lacquering. Sober, reliable, and can furnish the best of reference. Address BOX 151, care THE METAL INDUSTRY.

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SITUATIONS WANTED—Platers—Continued

SITUATION WANTED.—NICKEL and BRASS PLATER. Forty years old, sober and industrious. Experienced in the making of all solutions. Steady position desired. Moderate wages. Address BOX 133, care THE METAL INDUSTRY.

SITUATION WANTED.—By a plater who has made a specialty of GALVANO PLASTIC WORK. Can furnish the best of reference. Address BOX 143, care THE METAL INDUSTRY.

SITUATION WANTED.—By a first class GOLD, SILVER, NICKEL, BRASS or COPPER and all round PLATER to take charge of large plating plant. Can give the best of references and will consider no position unless steady. Address O-13, care THE METAL INDUSTRY.

SITUATIONS WANTED—Platers—Continued

SITUATION WANTED—By a first class PLATER who has had 18 years' experience on all finishes on any metal. Can furnish good reference. Address M-6, care THE METAL INDUSTRY.

SITUATION WANTED.—By an ELECTRO-PLATER, 18 years' experience with Nickel, Copper, Brass and Bronze solutions and oxidizing. Can furnish good reference. Address BOX M-9, care THE METAL INDUSTRY.

SITUATION WANTED—By a young man who has had 8 years' experience. Can do all kinds of PLATING and FANCY COLORING. Position in New York City or vicinity preferred. Address BOX 175, care THE METAL INDUSTRY.

Have You a Want?

¶ Let it be known in THE METAL INDUSTRY Trade Wants, and you will get what you want. Everyone does.

¶ Our Want Ad. Page is a Regular Exchange for supplying the immediate wants of the Metal Trades.

¶ Answers sent in our care will be forwarded.

¶ Send your want in at once and be happy.

¶ Have you a list of THE METAL INDUSTRY Books and Special Offer to Subscribers? Furnished free for the asking.

¶ THE METAL INDUSTRY, 61 Beekman Street, New York.

Bound Volumes

The files of 1908 of **THE METAL INDUSTRY** are now ready. We have also a limited number of bound files for the years 1906 and 1907. These bound volumes comprise a library of valuable **Metallurgical, Mechanical** and **Chemical** information, and each volume is thoroughly indexed and nicely bound.

Some New Books

Sixth Edition. Electro-Deposition of Metals.
Practical Plating.
Cyclopedia of Formulas (a very useful book).
Prices and further particulars for the asking.

THE METAL INDUSTRY
61 Beekman Street :: New York

DIRECTORY

METAL ROLLING MILLS.

INGOT, SHEET, ROD, WIRE, TUBE, METAL GOODS.

HENDRICKS BROTHERS
Manufacturers of
Sheet and Bar Copper
COPPER FIREBOX PLATES
and STAYBOLTS
WIRE and BRAZIER'S RIVETS
IMPORTERS AND DEALERS IN
INGOT COPPER, BLOCK TIN,
SPELTER, LEAD, ANTIMONY
BISMUTH, NICKEL, Etc.
49 Cliff Street, NEW YORK

Established 1802 Cable Address: "Scovill"
SCOVILL MFG. CO.
WATERBURY, CONN.
THE LARGEST AND MOST FULLY EQUIPPED BRASS ROLLING MILLS AND METAL GOODS MANUFACTURING ESTABLISHMENT IN THE WORLD
Estimates for Specialties in Brass, German Silver and Aluminum furnished on application. DEPOTS:
NEW YORK: 75 Spring St. BOSTON: 170 Summer St. CHICAGO: 210 Lake St.

WATERBURY BRASS CO.
General Offices, Mills and Factories.
Waterbury, Conn.
NEW YORK OFFICE, 99 JOHN STREET.
Providence (R. I.) Store, 131 Dorrance St.
Shipments Upon Receipt of Order
From Large Stock of
SEAMLESS DRAWN BRASS AND COPPER TUBING
BRASS { SHEET ROD WIRE
COPPER { SHEET ROD WIRE
GERMAN SILVER { SHEET ROD WIRE
AT WATERBURY

Non-Corrosive Finest Quality
COPPER AND YELLOW
(Muntz) Metal
Naval Brass
Naval Bronze
Manganese Bronze
Plates, Sheets, Bolts, Bars, Rods, Nails, Tacks, &c.
Taunton-New Bedford Copper Co.
NEW BEDFORD, MASS.
17 Water St., New York 61 Batterymarch St., Boston

C. G. HUSSEY & CO.
PITTSBURGH, PENNA.
Manufacturers of
COPPER
In Sheets, Plates, Rolls
ANODES
Tacks and Nails

Bridgeport Brass Co.
BRIDGEPORT, CONN.
Postal Telegraph Building,
Broadway and Murray St, New York
17 N. 7th Street, Philadelphia
Manufacturers of
Brass and Copper { Sheet Tubing Wire and Rods.
Metal Goods Made to Order from Sheet, Rod, Wire and Tubing

BRASS and COPPER in Sheets and Rolls
SILVER PLATED METAL (for Coach Lamps)
BRITANNIA METAL
B. & M. BABBITT METAL for Bearings
LINING METAL for Automobile Bearings and Copper for Electrical Purposes
H. K. & F. S. BENSON
GLEN RIDGE, N. J.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN.
German Silver
BRASS, COPPER and BRONZE IN SHEETS, WIRE, RODS and TUBES
COPPER AND NICKEL ANODES
Resistance Wires, Wire, Shot Copper

ROME METAL CO.
ROME, N. Y.
MANUFACTURERS OF
SEAMLESS BRASS AND COPPER TUBING
SMALL SIZES THIN GAUGES
SPECIAL SHAPES
FOR ALL PURPOSES

The Ansonia Brass and Copper Co.
99 John St. New York
MANUFACTURERS OF
BRASS and COPPER Sheets, Tubes, Rods and Wire
SOLE MANUFACTURERS TOBIN BRONZE
(Trade-Mark Registered)

PHENIX TUBE CO.
Manufacturers of
Brass and Bronze Iron Lined Tubes
Brazed Steel Tubes,
Round and Square.
Main Office and Mills: Brooklyn, N. Y. City Branch Offices: Chicago, San Francisco

Baltimore Copper Smelting and Rolling Company
BALTIMORE, MARYLAND.
SHEET COPPER

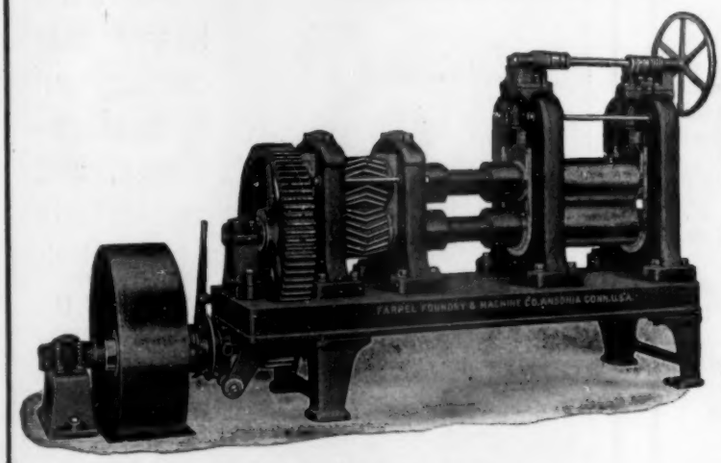
"RIVERSIDE" German Silver Phosphor Bronze
Sheets, Rods, Wire, Ingots, Castings, Jewelers' Bars and Alloys
The Riverside Metal Co.
Riverside, Burlington Co., N. J.

See Page 46 for The Phosphor Bronze Smelting Co.'s Advertisement

FARREL FOUNDRY & MACHINE CO.

ANSONIA, CONN.

BUILDERS OF



10 INCH ROLLING MILL

Rolling Mills

For Brass, Copper, Lead, Tin, Zinc, Aluminum, Britannia, Silver, and the softer metals—up to the largest sizes

Chilled and Gray Iron Rolls

HEAVY CASTINGS

Alligator Shears, 8 sizes **Roll Grinding Machines** **Gate Shears** **Railroad Cranes**
Cinder Grinders **Cabbaging Presses** **Sheet Metal Straighteners**
Lead Pipe Machinery **Coil Friction Clutches (Pat.) for any speed or power**
Gearing—Cut, Machine-moulded, Pattern. **Shafting, Pedestals, Couplings, Etc.**

CUT DOWN YOUR PRODUCTION COSTS BY USING WATSON-STILLMAN

HYDRAULIC TOOLS

We make hydraulic Punches, Shears, Riveters, Presses, Benders, Pumps, Accumulators, Jacks, etc., which embody every improvement for getting the greatest speed, efficiency and economy from hydraulic power. If you have work requiring the above tools our large line probably offers a standard model that will meet the requirements. If not we will build to order on short notice and at reasonable cost. Send your name for catalogs and state what lines interest you.

THE WATSON-STILLMAN CO., 196 FULTON STREET, NEW YORK
CHICAGO: 453 THE ROOKERY

The TORRINGTON MANUFACTURING CO.

TORRINGTON, CONN.

Finishing Machinery for Brass and Copper Mills to Order

Acid Cleaning, Steam and Sawdust Drying-out Machines.
Power Presses, Single and Double Action Cam or Crank.
Flattening, Straightening and Overhauling Machinery.
Multiple Plunger, Cut and Carry Presses.
Slitters, Scrap Cutters and Coilers in a variety of Styles and Sizes.
Channel Iron Mill Trucks to suit any Requirement.
Metal Saws and Power Shears.
Drawbenches.

SPECIAL MACHINERY AND TOOLS OF ANY DESCRIPTION

COLLEGES will have the BEST of EVERYTHING

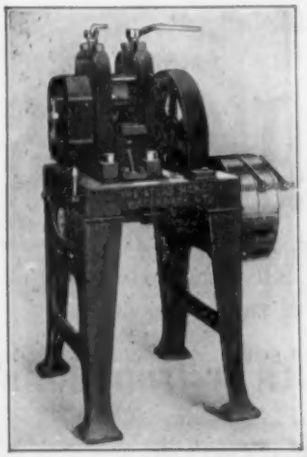
There are 90 Otto Gas Engines in 90 different Universities, Colleges and Schools — we shall be pleased to send you the list. Surely if we can satisfy the college faculties, our engines will satisfy the power requirements of your shop.

Catalog G will tell you why. Send for it, giving details of your needs.

THE OTTO GAS ENGINE WORKS, Phila, Pa.

SEE PAGES 45-48 FOR INDEX TO ADVERTISEMENTS

"THE ATLAS"

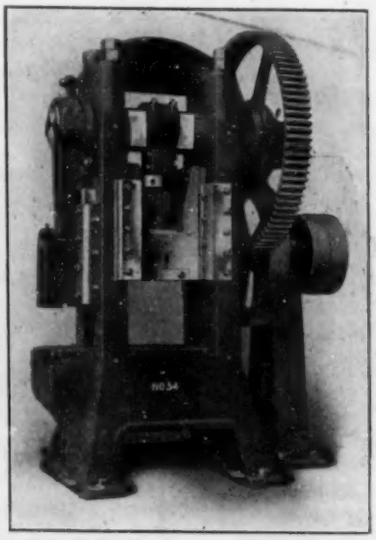


6" x 2½" Rolling Mill with Water Circulation.
Rolls of Best Quality Tool Steel, Carefully Hardened and Ground.
Gear Ratio 4 to 1.
Pulleys 20" x 3".
Net Weight 1,000 lbs.
Can Furnish any Size Mill up to 12" dia. Rolls.
Width of Face as Required.
Power Presses.
Foot Presses.

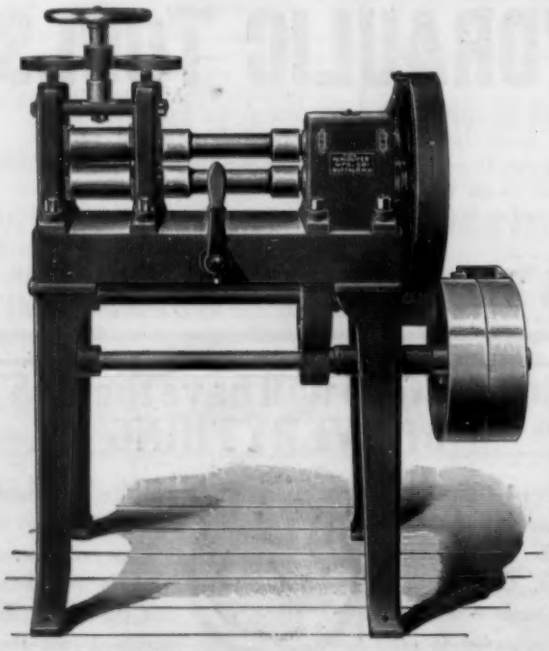
Metal Straightening Rolls.
Metal Slitters. Special Machinery.

THE ATLAS MACHINE CO.
31 CANAL STREET WATERBURY, CONN.

BLANKING, Drawing, Shearing, Axe, Pickeye, etc., Presses, Cornice Brakes, Shears, Rolling Mill Machinery and any heavy machinery on specifications, and particularly Chilled Rolls turned, ground and polished.



A. GARRISON FOUNDRY COMPANY
SO. MURIEL STREET, PITTSBURGH
Established 1803



Oliver Quality Rolling Mills are built in thirty different styles and sizes. Catalog D 16 describes them. May we send you a copy?

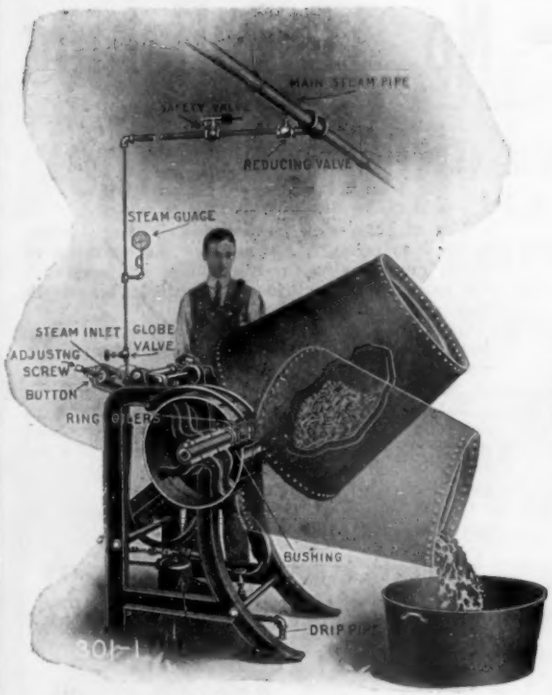
The W. W. Oliver M'f'g. Co.
1499 Niagara St., BUFFALO, N. Y.

ROLLS
FOR STEEL, IRON, BRASS, COPPER AND RUBBER WORKS

Philadelphia Roll & Machine Company
23d Street and Washington Avenue, Philadelphia, Pa.
Western Sales Agent.
CHARLES R. BRYSON,
501 Curry Bldg.,
Pittsburgh, Pa.
Cable Address:
"Philrolleo., Philadelphia."
Long Distance and Local 'Phone.

Cold Rolling Mills
Slitting and Trimming Machinery
CIRCULAR SHEARS
Automatic Pickling Machines

August Schmitz
Dusseldorf 64
GERMANY



BAIRD STEAM DRYING BARRELS

are for drying goods and are largely used for drying articles after rolling or plating.

The tumbling motion of the barrel brings all the sawdust in contact with the sides of the barrel, and thus the drying is thoroughly and quickly done.

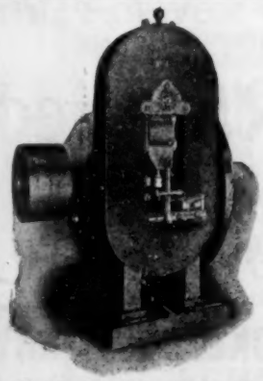
This action also brightens metal goods.

The condensed steam is automatically ejected.

BULLETIN 301

THE BAIRD MACHINE CO.
Oakville, Conn., U.S.A.

Telegrams:
BAIRDMACHN, WATERBURY.
Western Union Code.



"Bliss" Coining and Embossing Press No. 4

"BLISS"
SHEET METAL WORKING MACHINERY

We build the most complete line of modern sheet metal working machines, equipped with every convenience for the rapid and economical production of sheet metal goods. Our machines cover every need of the sheet metal manufacturer.

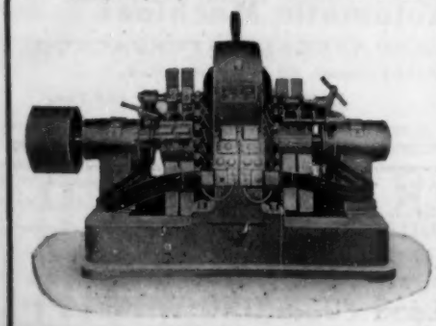
"BLISS" COINING AND EMBOSSING PRESSES

are built in 10 sizes and various styles, weighing from 1,200 to 26,000 lbs., and capable of exerting up to 1,000 tons pressure.

"Presses for Every Purpose"

E. W. BLISS COMPANY, 23 Adams St., Brooklyn, N.Y.

DYNAMOS



For Electroplating, Electrotyping and Electro-Galvanizing in single, two and three voltages

60 to 10000 Amperes, 3 to 30 Volts

Shunt, compound and separately excited

Write for Catalogue

CHAS. J. BOGUE ELECTRIC CO.
513-515 West 29th Street
NEW YORK

Cable Address "MACHELECT" 'Phone, 581 Chelsea

GLOBE TILTING TUMBLING BARRELS

Illustrating Method of Dumping.

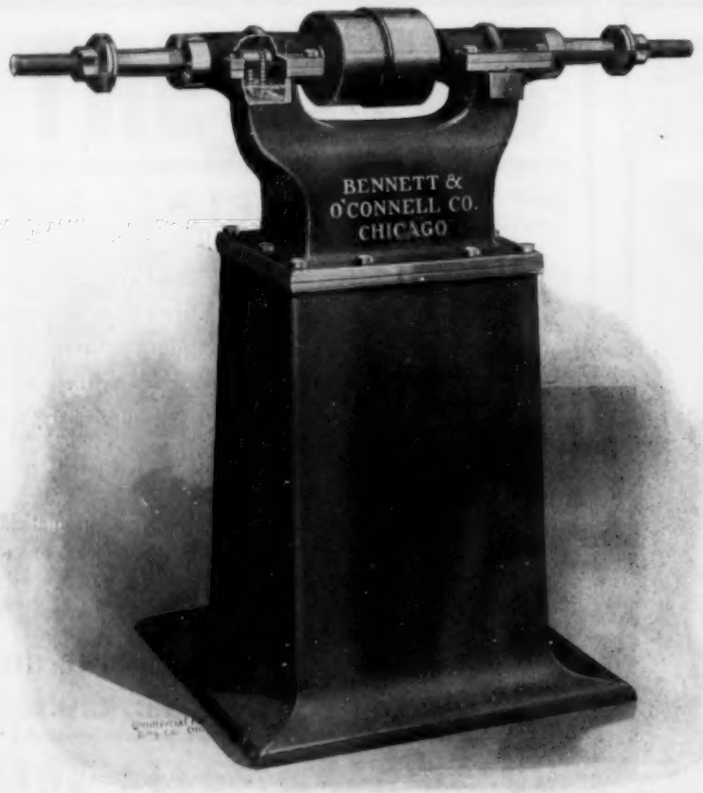
Easily adjustable for more or less violent rattling. Easily dumped.

Easily swept around—it's a one-legged machine. Sieve Cap provides easy way to separate saw dust from tumbled material. Ten sizes. Ask for catalog.

Ask for "The Silent Partner"

THE GLOBE MACHINE & STAMPING CO.

3878 Hamilton Avenue, :: CLEVELAND, O.



REAR VIEW SHOWING CHAIN OILER AND OIL RESERVOIR.

No. 10 Polishing AND Buffing Lathe

The makers of Polishing and Buffing Lathes, as well as other equipment for the finishing of work, must design their machines to meet with the modern demand for the purpose for which they are built.

Our Polishing and Buffing Lathes are made from the best gray iron, and the spindles are made from hardened steel turned and ground to fit.

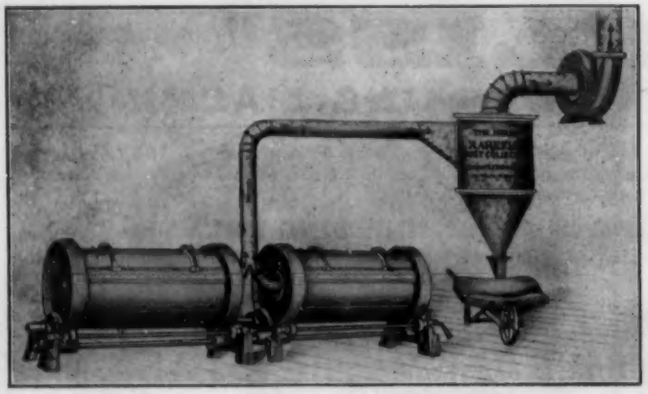
This illustration shows our No. 10 Lathe with tight and loose pulley to belt from overhead shaft. We also furnish this lathe with tight pulley to belt from countershaft. The spindle is 1¼ in. through the bearings and 52 in. long.

Our No. 5 catalogue gives full dimensions of this lathe and other sizes, as well as

COMPLETE ELECTRO PLATING OUTFITS FOR NICKEL, COPPER, BRASS, BRONZE, ZINC, GOLD AND SILVER

Write for Catalogue TMI

Bennett-O'Connell-Stephens Co.
97-99-101 So. Clinton Street
CHICAGO, ILL.



NO CLOTH : : NO MOVING PARTS
NO CUTTING OUT OF FANS

The ... Morse Rarefied DUST COLLECTOR

—FOR—

Sand Blast, Tumbling Mills, Emery Wheels

MAN'F'D EXCLUSIVELY BY

THE KNICKERBOCKER COMPANY
JACKSON, MICHIGAN

POLISHING BELTS and TAPE

ALL KINDS

Any width or thickness made to order on short notice and large stock always on hand.

GILMER COMPANY
PHILADELPHIA PA.

Annealing Without Oxidation by Automatic Machines

BATES & PEARD ANNEALING FURNACE CO.
C. M. DALLY, Agent, 29 Broadway, N. Y.

NO PICKLING
NO SCALE

Large Saving in Labor and Fuel
Illustrated Catalogue Sent on Application.

AMES SWORD COMPANY

CHICOPEE, MASS.

Manufacturers of

ENDLESS SEWED POLISHING BELTS

Correspondence Solicited *Discounts Quoted*

MILLER ELECTRIC CO.

16-20 William St., NEWARK, N. J.

Importers and Manufacturers of

Platers' and Polishers' Supplies

HIGH-CLASS POLISHING WHEELS

For Grinding, Buffing and Polishing

Makers of the Celebrated "WALRINE" Leather Wheel.

ESTABLISHED 1888 TELEPHONE 2577 SPRING

PHILIP SIEVERING

ELECTRO PLATER AND POLISHER

NICKEL PLATING A SPECIALTY

JOBBING IN ALL ITS BRANCHES

255-257-259 Centre Street,
Corner Broome Street,
NEW YORK CITY

Gold, Silver, Copper, Brass and Bronze Plating
Polishing and Buffing
Acid Dipping and Lacquering

Peerless Polishing Wheel

(Sectional View)

A frim of pieces of leather set edgewise on a center of wood and held firmly by a metallic band on which they are strung. A very durable wheel for medium and heavy work. Not affected by atmospheric changes.

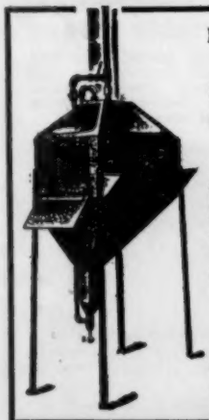
Write for Circular "PW."

THE PFLEGHAR HARDWARE SPECIALTY CO.
NEW HAVEN, CONN.

BRUSHES

Brass, Copper and Steel Wire Brushes
An assortment of Machine and Circular Brushes.—
Chandelier Manufacturers', Silver and Nickelplater's Brushes, etc.
Repairs Promptly Attended to.

HERMANN BLUMENTHAL & CO.
Manufacturers
241-243-245 CENTRE ST., NEW YORK



LEIMAN'S AUTOMATIC CONTINUOUS FEED
SAND BLAST $17 and up GUARANTEED
FOR ALL CLASSES OF WORK
Used with Foot Bellows or Blower

NOISELESS BLOWERS $17 and up
Take up their own wear
FOR FURNACES, BLOW PIPES, SAND BLASTS, ETC.
NO SPRINGS TO BREAK. NO TIPS ON THE WINGS

LEIMAN BROS. 64 JOHN ST. NEW YORK
72 BONYKAMPER AVE., NEWARK, N. J.

THE ECONOMY Wire Wheel Brush

For cleaning all kinds of castings and metal work.
Invaluable to the Brass Founder, Electroplater and in the General Machine Shop.

One Man with an Economy does the work of Five Men with other methods.

Write for Catalog No. 111.

THE OSBORN MANUF'G CO.
CLEVELAND, O.

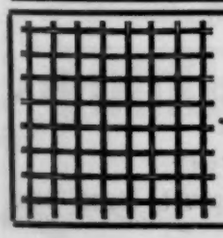
HARTMANN ALUMINUM SOLDER

Nine months ago our business of repairing aluminum automobile castings was established, and the great success we have attained (which is vouched for by many prominent automobile houses in New York City) has created such a widespread demand for the Hartmann Aluminum Solder that we have decided to place it on the market, thereby making it available to all who are in need of an absolutely ideal solder for aluminum.

The Hartmann solder is used without any flux and is remarkable for its great tensile strength and its capacity to withstand oxidation and deterioration from any cause.

Prices, samples, and a list of our regular patrons furnished upon application.

THE HARTMANN COMPANY 426 West 52d Street, NEW YORK

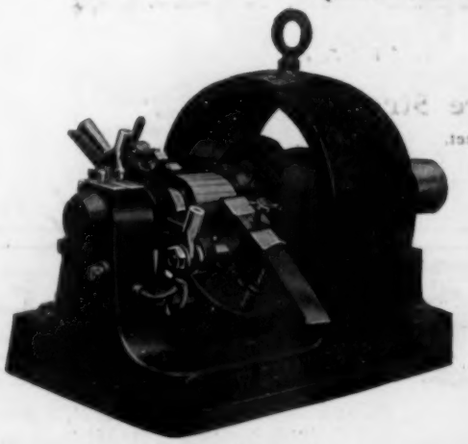


IF YOU READ THIS SIGN, OTHERS WILL READ YOURS

BUFFALO WIRE WORKS CO.

WIRE CLOTH WIRE SIGNS, WIRE WORK ARTISTIC METAL WORK SEND FOR OUR CATALOGUE No. 8-C BUFFALO N. Y.

W. CANNING & Co.
BIRMINGHAM
(ENGLAND)

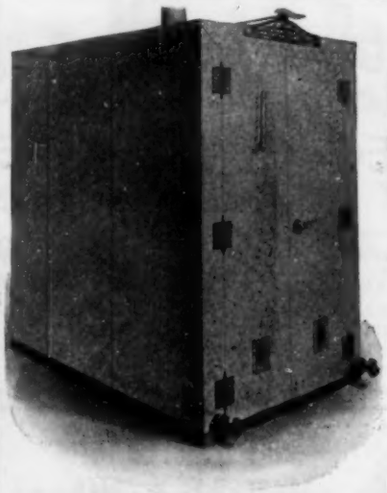


Manufacturers of

ELECTRO-PLATING & POLISHING MACHINERY, MATERIALS & CHEMICALS

LOW VOLTAGE DYNAMOS from 20 to 3000 Amperes for Electro-Depositing, Metal Refining, etc. CANNING'S "SPECIAL" Nickel Salts, "LUSTRE" Polishing Composition.

Contractors to H. M. Government and other Governments, Railways, etc. Established 1785



THE
Gehnrich
Sectional Portable
OVEN

Used for

Japanning
Lacquering
Enameling
Core Baking
Drying
Tempering
Sherardizing

STANDARD SIZE OVEN.

HERMANN GEHNRICH, Manufacturer

518 Water Street, NEW YORK

Send for Catalog "TMI"

STANDARD SIZE OVEN KNOCKED DOWN

Acid-Proof Brick

FOR TWELVE YEARS

we have been manufacturing a high-grade Acid-Proof Vitrified Non-Absorbent Brick suitable for Acid Tanks, Plating Room flooring, etc., etc.

These bricks immersed in a 50% Sulphuric Acid solution for several months show no signs of deterioration.

INQUIRIES SOLICITED.

NEW YORK BRICK & PAVING CO.

Syracuse, N. Y.

The Steiner Sectional Portable Ovens

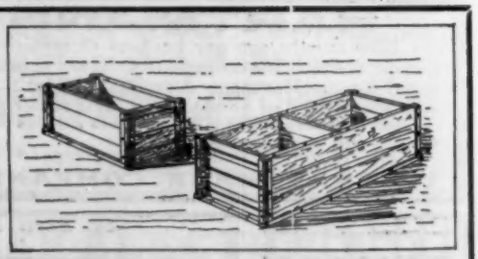
Designed to meet special conditions. Heated by gas and adaptable for many lines of manufacture. Used for Japanning, Enameling, Baking and Drying. Has many superior advantages.

DRYING OUT BOXES

Fitted with steam coils or gas burners where steam is not available. Send for Catalogue.

E. E. STEINER, 80 UNION ST., NEWARK, N. J.

TANKS



Electro-Plating Tanks

A SPECIALTY

Write for Prices

THE A. T. STEARNS LUMBER CO., Neponset, Boston, Mass.

HEADQUARTERS FOR ALL THAT IS NEWEST AND BEST

The "IXL" Lathe
For Grinding and Polishing.

Detachable Spindle, Strong, Efficient, Inexpensive.

Belt runs to shaft overhead or through floor.

IN

EQUIPMENT AND SUPPLIES FOR

Electro-Platers Polishers, Buffers Galvanizers

VICTOR WHITE POLISH
For imparting a fine lustre to nickel-plated work.

Tripoli and Crocus Composition

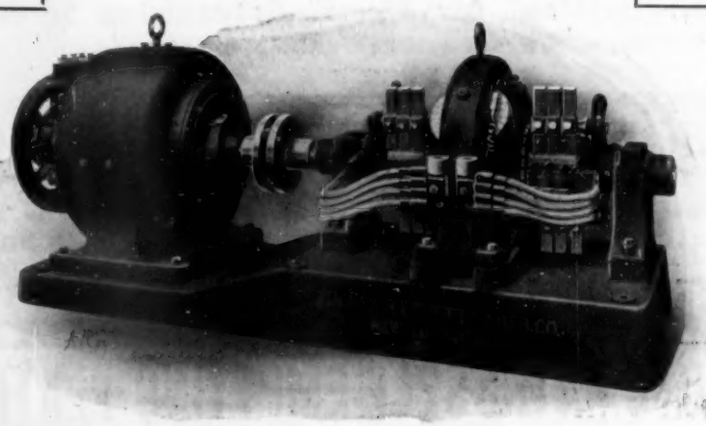
CARBONATE of COPPER and NICKEL SALTS

HAVE you heard of the remarkable records made by our new

Triplex Buff?

How it gives double the wear?
How it saves one fifth the composition?
How it can be remade to original size when worn down?

See cut below.



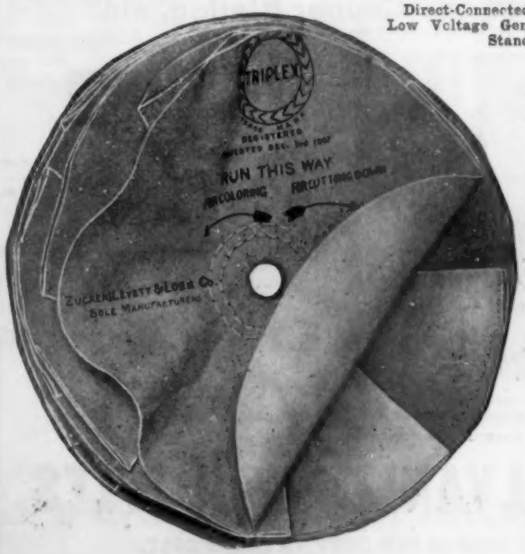
Direct-Connected Generator Set, Size G. G., Type S. H.
Low Voltage Generators, 25 to 12,500 Amperes Capacity.
Standard or Three Wire Systems.

THE 1908 ROTOPLATER

Plating and Finishing at one operation in Nickel, Copper, Zinc, Brass or Bronze.

Small sample lots plated free to demonstrate its efficiency.

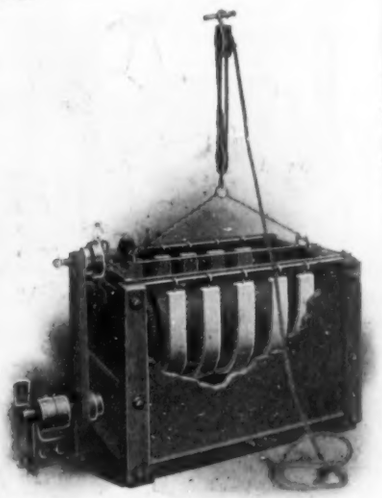
See cut below.



TWO-BAR SILVERITE NICKEL ANODE

Send for Description.

Also Anodes of all metals made.



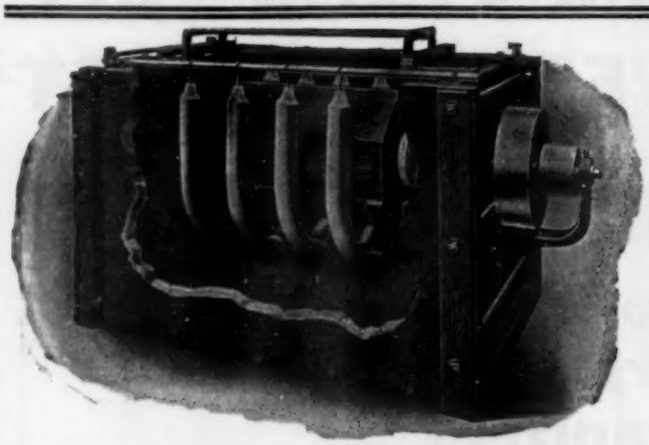
ZUCKER & LEVETT & LOEB CO., New York City, U. S. A.

BRANCH OFFICES:
CHICAGO, ILL. BIRMINGHAM, ENG.

Electro-galvanizing Outfits Without Royalty on Solution
Complete Plants Installed and All Supplies for Electro Plating and Polishing

PLEASE MENTION THIS PAPER WHEN WRITING.

MECHANICAL ELECTRO-PLATING APPARATUS



STYLE "B"

Patented June 22, 1897, Feb. 24, 1903, Oct. 11, 1904.
Other patents pending.

The most efficient plating apparatus in the market. Over 500 in use by the trade.

We will finish sample lots of work without charge.

This apparatus is a proved money saver where small work is to be plated. Can be used in Nickel, Copper, Brass, Zinc and Silver Solutions.

No Stringing. No Wire Used. No Metal Plating Trays or Baskets. No Unstringing. No Loss of Metal.

Capacity: 50 lbs. to 500 lbs., according to size.

Basket can be removed at will—without interfering with drive. In larger sizes basket is raised and lowered automatically.

Useful for plating: Bolts, Nuts, Rivets, Screws, Buckles, Ferrules, Typewriter and Sewing Machine Parts, Lamp Fixtures, Saddlery and Trunk Hardware Carriage Trimmings, Screw Tops, Shells, Stove Fittings, Locks, Keys and small work.

Apparatus is Used for Electro-Galvanizing Small Articles

We Can Furnish a List of Over 200 Users of this Apparatus. Many of the Larger Firms Are Using 10 or more

WRITE FOR BULLETIN No. 113

The HANSON & VAN WINKLE COMPANY

Manufacturers of Dynamos from 50 to 5,000 Ampere Capacity, and all Supplies for Electro-deposition.

(WRITE FOR BULLETINS 105 and 112)

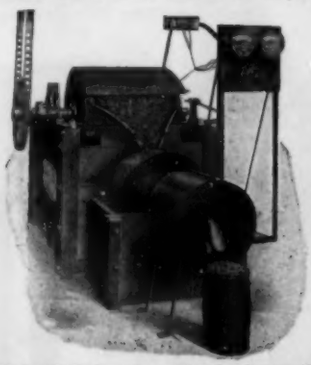
Main Office and Factory
219-221 Market Street,
NEWARK, N. J., U. S. A.

Branches
28 South Canal Street,
CHICAGO, ILL., U. S. A.

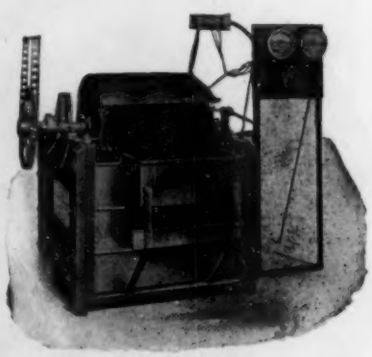
PATENT AUTOMATIC SELF-EMPTYING PLATING BARREL

For Electro Galvanizing, Nickel, Brass and Copper Plating, etc.

View while Plating.



Provided with Patent Apparatus for Automatically Washing, Drying, Delivering Material.



View while Emptying.

These Operations are Accomplished by Simply Reversing Motion of Barrel.

ELECTRO PLATING AND GALVANIZING OUTFITS

BY USE OF OUR PATENT HANDLING DEVICES SAVING OVER 50 PER CENT. IN LABOR COST.

DYNAMOS UP TO 8,000 AMP. POLISHERS' AND BUFFERS' MACHINERY AND SUPPLIES, CHEMICALS, ANODES (CURVED), LACQUERS, ETC.

U. S. ELECTRO GALVANIZING CO.

Main Office and Factory,
No. 1-9 Park Ave.

BROOKLYN, N. Y.

"Send for Bulletin 89."

SOMETHING GOOD FOR THE POLISHING ROOM

INDEPENDENT SPINDLE POLISHING AND BUFFING LATHE

Forged Steel Clutches **Double Friction Cones**
Hand Lever to Throw Clutch In or Out
Made for Wear

TWO SPINDLES DRIVEN BY ONE BELT
DISPENSES WITH COUNTERSHAFT
STOPS AND STARTS INSTANTLY EITHER END
SAVES POWER, TIME AND SPACE
REDUCES COST OF WORK SAVES MONEY

Compute the time lost while one polisher changes wheels! This time can be saved, for the other man goes right on. Customers claim a saving of 50 hours per month.

The lathe is strong; spindle of large diameter; boxes ample; babbitt bushings; ring oilers; can be belted from above or below.

SEND FOR BULLETIN No. 118

MANUFACTURED BY

THE HANSON & VAN WINKLE CO.

NEWARK, N. J. CHICAGO, ILL.

NICKEL SALTS AMYL ACETATE
CYANIDE POTASH
BISMUTH CADMIUM

These are only a few of the chemicals sold by us. Send for complete list.

We have high grade material at low prices.

FOR PLATERS AND BRASS MANUFACTURERS

Correspondence Solicited

McKESSON & ROBBINS

Manufacturing Chemists **NEW YORK**

E. REED BURNS

MANUFACTURER OF

Brass and Nickel Platers' Supplies

40 and 42 WITHERS STREET
BROOKLYN, N. Y.

WRITE FOR PRICES

WESTERN AGENCY 20 No. Desplaines Street, CHICAGO

We Solicit Inquiries For

CAUSTIC POTASH, prime qualities
SAL AMMONIAC for galvanizing and soldering
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BARIUM CHLORIDE, FERRO PRODUCTS,
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It may be better suited for your purposes than the material you now use. *It may save you money.*

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"ELECTRIC" CLEANING COMPOUND

IS ADAPTED FOR CLEANING ALL METALS BEFORE PLATING

Cleveland, O., January 4, 1909

Cleveland Platers Supply Co., City

Gentlemen:—I have had charge of the plating department of The North Electric Co., of this city, for the past four years, and have been using your "Electric" Cleaning Compound since November, 1907. Prior to the time of trying out your compound, I had been using a cyanide and potash electric cleaner continually for three years.

My fourteen months' experience with your compound has demonstrated that it is a better cleaner, in every respect, than the cyanide and potash cleaner. Not only does the "Electric" compound clean all of my polished brass and steel work thoroughly, but I also use it for cleaning large quantities of soldered tin boxes, and also zinc transmitter fronts. Before using your material, this tin and zinc work had to be hand scrubbed, as it could not be cleaned in the cyanide and potash cleaner without becoming badly stained and oxydized.

Our work consists of telephone parts, and our output is very large, but I do not find it necessary to scrub any of the work.

The expense for making up and maintaining your cleaning solution is about one-half as much as for the cyanide and potash cleaner. Yours truly,

THOS. SWEENEY

(Publication of above letter sanctioned by The North Electric Co.)

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CLEVELAND PLATERS SUPPLY CO.

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"CLEANING BY ELECTRICITY," a booklet on electric cleaning, mailed free to any address.

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Leaders in their respective lines used our products in their coloring rooms in 1908.

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"A Composition for Cheapness,

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The Lacquer has more to do with selling your goods than any other one thing. Why not use the reliable "NIKOLAS" brands and thereby prevent destruction?

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You probably never heard of it. We have it!
Absolutely no discoloration. No green drip.

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VALUE.

The value to you in using Egyptian Lacquers is not measured by the price you pay.

They cost no more than many inferior makes, but in appearance—in service and in satisfaction, are worth a lot more than the other kind.

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"New Era" Lacquers HAVE QUALITY

We Buy Quality, Talk Quality, GIVE QUALITY

"Quality is the underlying principle of the most successful businesses."

The manufacturer who calls your attention to the low price of his product has little else to talk about. While we try to keep within the bounds of Low Prices, we do not make a specialty of it.

We can satisfy anyone who is wise enough to see the value of the BEST regardless of the shade difference in the cost.

THE NEW ERA LUSTRE CO.

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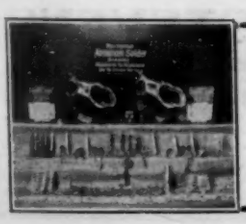

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Power Sprue Cutter

Immediate Delivery FROM STOCK

We have just completed another lot of the popular Power Sprue Cutter No. 2051

This machine will cut with ease a sprue ¾ inch square or the equivalent.

It is easily operated. Simply hold the foot treadle down till the work is finished.

The large throat gives ample room for conveniently handling brass castings.

The distance from the front of the cutters back to the frame is 12 inches, and it is 10¼ inches from the top of the lower cutter holder to the bottom of the guides.

Floor space required only 34 x 30 inches.

Write for further particulars.

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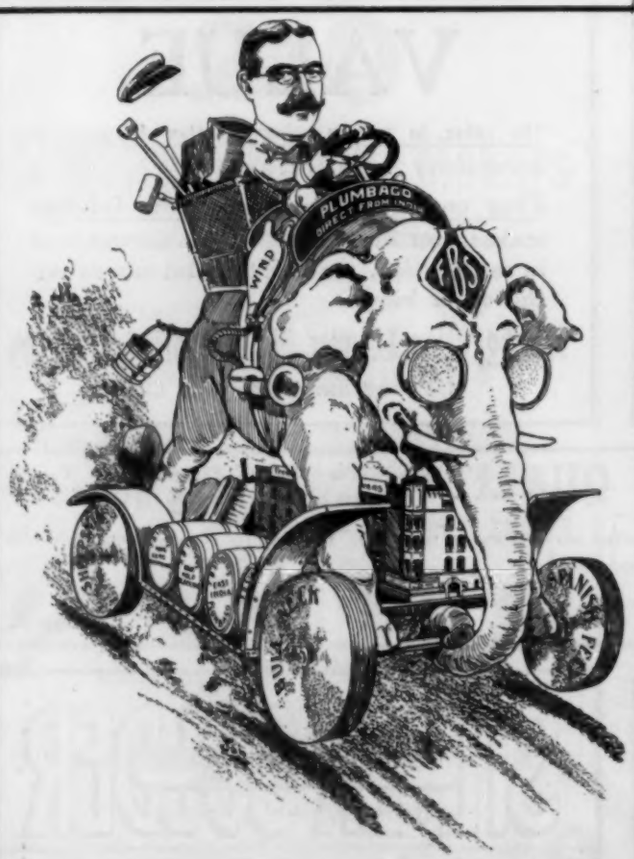

ON TIME

We have discovered a double barrelled way of getting there with both feet at the same time.

If you would keep your plating department up with the procession, you should use my solid CANVAS WHEELS. They are used for "cutting down," and more information may be given in more space—say, on a letter sheet; will you write me? If you are looking for the dark blue "looking glass lustre" the stove manufacturers desire, buff nickel plates with "STEVENS' WHITE POLISH 'H'"; if the bright lustre, then STEVENS' SILVER FINISH on a Spanish felt wheel for nickel, or on cotton buffs for brass.

If you are running a gray iron foundry, say at automobile speed, my foundry facings will help you. I manufacture the entire line for foundryman and for plater.

FREDERIC B. STEVENS

MANUFACTURER

Foundry Facings and Supplies

Buffing Compositions and Platers' Supplies

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